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BRITISH MEDICAL JOURNAL

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WAR NEUROSES AFTER PSYCHOLOGICAL TRAUMA

BY

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The argument falls under two heads: (1) That a psychoneurosis, or, more correctly, a mental or a combined mental and physical disturbance, may be produced by a sudden frightening experience, and that this neurosis may be of a type which ultimately presents no symptoms except those produced episodically by associative arousal by some reminder of the original traumatic experience. These episodic symptoms may, however, be disabling while they last. (2) A traumatic psychoneurosis, either in this special sense or with persistent and not mainly episodic symptoms, may depend on either (*a*) a disturbance nearer the physiological level, depending on properties common to all organisms; or (*b*) a disturbance mainly at the psychological level, depending on the particular type of personality, especially the ego-organization, whether anxious, hysterical, or what-not.

"Traumatic neurosis," in the sense of a mental or a combined mental and functional-physical disturbance of some kind following a psychological stimulus from without, usually implies two things: that the event impinges suddenly, and that the subsequent disturbance persists for some time. In a war the provocative stimulus is usually one of fear, less often one of horror, or both combined.

The present study was prompted by a doubt whether in the case of flying personnel we know all we should know about psychiatric disabilities after flying accidents and terrifying experiences in combat, and whether we may do less than justice from the medical aspect in some cases in which disciplinary problems arise. The individuals studied presented no history suggesting head injury, or at most a very transient impairment of consciousness after the accident.

Three main kinds of speculation have been invoked to help in the understanding of the traumatic neuroses: (*a*) hypotheses based on biological analogies, especially the comparison of stupor following fright with the immobility reactions of animals; (*b*) speculations based on neurophysiological considerations, mainly Pavlov's (1928) formulations; (*c*) psychopathological and especially psycho-analytic speculations.

The first does not help us much except perhaps with regard to such transient stupors as those described by Hubert (1941). They might be regarded from this standpoint as regressive phenomena. Rivers (1920), in the last war, extended this analogy of sham-death to partial reactions, such as the immobility of a hysterically paralysed limb.

Pavlov's (1928) physiology offers a more seductive kind of analogy. The observation that reminders of a shattering experience may still produce mental reactions is of course very old. For example, Sir John Fortescue mentions that a lady who had been in the siege of Lucknow, in which her husband had been killed, and who had since remarried, would still, years afterwards, turn pale and tremble at the very mention of the place. This phenomenon of the "conditioned reflex" in its various elaborations can be applied in an interesting way to a description of war neurosis in general in Pavlov's and, to a lesser extent, in Sherrington's terms. Thus Love (1942) speaks of fear as a reflex, and increasing susceptibility to fear as due to facilitation of this reflex. He also suggests that the prolonged inhibition of fear may itself lead to a neurosis, just as delayed inhibition leads to an experimental "neurosis" in Pavlov's dog. This has been extended by Symonds (1943) to sudden traumatic experiences, when the individual seems to have been unaware of fear at the time but develops psychoneurotic symptoms some time (perhaps a day or two) afterwards. Pavlov's (1928) observation that ultramaximal stimuli, instead of producing excitation, produce the paradoxical result of inhibition, might be invoked to explain the phenomenon of stupor resulting from terrifying experiences.

The psycho-analytic view as propounded originally by Freud (1922) appeared to be concerned primarily with accidents in which some sudden physical stimulus impinged on the body surface. He says: "I think one may venture, tentatively, to regard the ordinary traumatic neurosis as the result of an extensive rupture of the barrier against stimuli." In this way the old doctrine of shock would come into its own again, apparently in opposition to a later and more psychologically pretentious view, which ascribes aetiological significance not to the effect of the mechanical force but to the fright and the menace to life. He pictures the stimulus which has broken through the barrier as having to be "bound" by charges of energy drafted from elsewhere in the organism. What conditions fright is the failure of the "mechanism of apprehension" to make the proper preparation, including the overcharging of the system first receiving the stimulus. The dreams of patients suffering from traumatic neuroses are attempts at restoring control of the stimuli by developing apprehension, "the pretermission of which caused the traumatic neurosis." This suggests the paradox that the greater the apprehension the less the likelihood of developing a traumatic "neurosis." There may be some truth in this in that it appears, according to my observations, that anyone, no matter how stable he may be, may develop a traumatic neurosis in the sense of recapitulatory dreams and "conditioned" responses if the traumatic experience is terrifying enough, while individuals of more anxious temperament are more apt to develop increased apprehension and the ordinary symptoms of anxiety. Freud (1922), however, adds that the traumatic neuroses of war may arise more easily as the result of ego-conflict. Following this hypothesis, Kardiner (1941) believes that a psychic trauma may leave the ego handicapped or restricted in its adaptation to the external world.

I suggest that there is some truth in all these theories and that there are at least two types of psychoneurotic response to a terrifying stimulus—one depending more on the physiological properties common to the nervous systems of all individuals, and another depending on the psychological aspects of the personality. There is no "unnecessary dualism" here; it is simply that one type of response is at present describable more in physiological terms and the other in psychological. They can be regarded as occurring at different levels of personality-integration.

"Simple Traumatic Neurosis"

The central feature of the classical traumatic neurosis has been the recurrent dream which recapitulates the traumatic event. Freud (1922) made it the point of departure for his observations on the repetition-compulsion phenomena. It

would not invalidate his speculations on repetition-compulsion if this kind of dream were to be found to depend not on disturbance of the organization of the ego but on more primitive properties. It would not be the first time in the history of medicine that a correct conclusion had been reached from a mistaken premise.

This type of dream may be regarded instead as a perseverative phenomenon at the physiological level. It can occur in mature personalities and it gradually dies out, like the fading of any other memory. That such experiences can persist in an engrammatic fashion is suggested by an observation of Penfield and Ericson's (1941). An epileptic girl aged 17 had had a fright at the age of 4 when a man came up behind her; she ran from him across a meadow to rejoin her brothers. Afterwards she had nightmares in which the scene was re-acted. Some time later she began to have attacks in which she showed fright, screamed, and clung to people, and these were followed by a major seizure. During the fright she saw the same scene, and was filled with terror lest she be struck or smothered from behind. This hallucination could be exactly reproduced by electric stimulus of the middle temporal gyrus.

The recurrence of a dream of a traumatic experience could be attributed to a similar automatic activity of a neural engram at a time when, as in sleep or in epilepsy, the inhibitory effect of the cortical activities is in abeyance. The occurrence of dream-like experiences, depending on a release of the cortical control, has been noted by Lhermitte and Tournay (1927) and others in mesencephalitic lesions.

In traumatic neuroses in stable individuals I would place alongside the recapitulatory dream at this lower physiological level a conditioned response to anything nearly recalling the original trauma. What presumably produces them both in the first place is the arousal of the fear apparatus of the organism. There is evidence that this is stimulated even in the absence of conscious fear. Anyone who has been through a sudden frightening experience knows that immediately the crisis is over a variety of bodily sensations, such as palpitation, tingling, tremor, etc., make themselves felt. These occur so immediately as not to be produced by rumination. They occur automatically in response to the perception of danger. The other kind of evidence for the arousal of automatic fear reactions is the observation that bodily disturbance can be produced by some reminder of the original trauma in the absence of conscious mental disturbance. For example: An R.A.F. pilot, walking in the country, was suddenly aware of palpitation and uneasiness. He could not understand this until he realized that a certain smell that he had just whiffed was associated in his mind with the smell of burning flesh in an accident in which he had been involved (Lees, personal communication). It is to be supposed, therefore, that the immediate stimulation of the emergency physiological processes may influence, by "stamping-in," the visual perceptions at the time, even in those cases in which the individual is not consciously afraid.

This last instance is an example of the other traumatic effect in Freud's discussion which is not taken account of, but which is more upsetting because more persistent than the recapitulatory dream—namely, the conditioned response to any reminder of the traumatic event. We are accustomed to think of "conditioned responses" in the Pavlovian experiments as being established only by repeated training; but it is a commonplace observation that they may be founded on a single experience, if it be intense enough. Horsley Gantt (1943) confirms that the same effect can be produced in an experimental animal. The phenomenon is not identical with the "startle" response to a loud noise; it is specific to associations with the original stimulus.

The following instance, I suggest, is typical of a "traumatic neurosis" or psychoneurosis produced in the way described.

An air gunner, aged 32, on the first occasion on which he flew in a rear turret (where one is entirely enclosed and separated from the rest of the crew) panicked and emerged from the turret into the body of the machine "blowing like a grampus"—as the others described it. He had been seized with panic at being shut in, but could not at first account for this. He was a well-built man of apparently stable temperament. His history, however, revealed that at the age of 15, just after he had started work in a large stores, he had an unusual and terrifying experience. His duty every Saturday afternoon was to place the books in the strong-room. On this particular occasion the door of the strong-room locked behind him and he found himself inside, with no apparent prospect of release till the following Monday. He began to feel that the atmosphere was getting more and more suffocating, and he became more and more frightened, until at last he realized that if he smashed a small red electric bulb he could sound the alarm and bring attention to himself. After he had been confined for about two and a half hours the door was opened by a watchman and guard armed with carbines, who naturally thought a burglar was inside.

He slept badly for some time after this episode and had nightmares recapitulating the experience. These gradually ceased, and the only symptom he could recall in the ensuing years was some uneasiness in confined spaces; for example, in buying a car of his own he had always chosen a roadster, as he was uncomfortable in a sedan.

The episode in the air was evidently an attack of panic depending on a "conditioned" associative arousal of the old experience. His heavy breathing was presumably related to the original fear of suffocation.

The deduction that suggests itself is that a condition which is otherwise symptomless may be disabling in specific situations. The reaction is automatic and independent of motive. It is important to note that the reaction which was produced included not only visceral components but conscious fear, of disabling intensity, as part of the reactive traumatic pattern. The similarity to Penfield and Ericson's (1941) case is suggestive, although there the releasing factor was the epileptic process.

Injustice would be done in such a case if the man were returned as fit because he complained of no symptoms in the ordinary sense. Someone may object that it is impossible to be certain that he was not motivated by a desire to avoid flying. One could only reply that evidence for this was lacking.

There are parallel instances where it seems possible to exclude motive, conscious or unconscious. A merely anecdotal example is Fortescue's story, already recounted; but documented examples are available from war experience. A W.A.A.F. officer, aged 39, who had been bombed out, had recapitulatory nightmares and retched a good deal. Long after the 1940–1 air raids had ceased she would retch again if she saw a chimney-pot damaged or a slate dislodged. She found it impossible to attain voluntary control of this symptom.

It seems justifiable, therefore, to suggest that an automatic, unmotivated, conditioned responsiveness may be produced by any sudden terrifying experience, such as an aircraft crash. The following is an example:

Sgt. A., an air gunner with 200 hours' flying to his credit, of which 40 had been spent in night flying, complained of loss of confidence and fear of night flying; he said he never got the feeling by day. Nine months previously he had been in his first night flight of any duration. The aircraft crashed on landing; he was trapped in the back of the machine and had to wait for people to cut him out. He wondered whether there would be a fire, but does not remember feeling particularly scared at the time. He dreamed of the crash afterwards, but otherwise showed no symptoms on the ground. In the air, however, he found himself in a state of acute apprehension, which increased with each attempt to fly. There was no evidence of timidity or any special tendency to anxiety in his previous history.

The argument, so far, is as follows: (1) There is a specific response to terrifying experience, not dependent on psychological attributes, but occurring more nearly on a physiological level. (2) This response consists principally of a recurring nightmare reduplicating the experience more or less exactly, and of a conditioned or associative response to stimuli resembling or in some way recalling the original experience. (3) Such a condition can exist independently of motive or volition. (4) The dream usually dies out, but the conditioned response is apt to persist indefinitely, without any other symptoms. (5) The response when re-aroused may involve only visceral reactions, or it may disturb consciousness as well by producing difficulty in concentration, together with conscious fear. (6) The result may be a condition specifically disabling for certain tasks—e.g., flying an aeroplane. (7) This theory may explain the good performance of such individuals in other circumstances—e.g., in the Army—afterwards.

As accessory symptoms there may exist a loss of emotional control, resulting in a form of irritability, but probably more often in some degree more generalized. Thus one man described his whole attitude as "excitable" and "fussy."

Anxiety and Other Psychoneuroses after Trauma

In individuals whose ego-organization is not stable, who are either anxious or narcissistic, the response to a traumatic experience may include the above characteristics, but it is usually shown either in persistent anxiety symptoms or in hysterical ones. In fact, in some apparent contradiction to Freud's (1922) original notion, those who are "prepared" with anxiety for any threat to existence are more apt to develop a psychoneurosis afterwards.

The following is an example of psychoneurosis after psychological trauma in which symptoms of anxiety and apprehension predominate. In such instances the traumatic experience probably simply accentuates a pre-existing state of anxious anticipation:

Sgt. B., aged 34, an air gunner under training with 30 flying hours in his log-book, was involved in an aircraft crash. He does not remember the machine actually hitting the ground; the first thing he remembers was that the aircraft was on fire and that he was being pulled out. Then "something blew up" and he was for a brief period unconscious. The next thing he remembers is being in an ambulance. He said: "When I came to and found the aircraft was on fire I looked round for a hatchet and was very calm. I still couldn't get out, and was reconciled to being burned. I was not worried. Then when I heard someone trying to get in I began to want to get out. Then he ran away, and this worried me; but he came back. I remember screaming 'Come back,' but up till then I didn't seem to worry what happened—I was more or less contented."

His symptoms now consisted of a "confined feeling" in the head, insomnia, pain in the back of the head, nervousness in any closed space, whether a bus or a building, and difficulty in concentrating and in remembering. He was obsessively preoccupied, not with the accident but with the idea of flying again. He felt relief in contemplating a newspaper photograph of a peaceful rural scene. "I look at the photograph and I feel more confident; it's peace and quiet." In temperament he was timid, anxious, a poor mixer, emotional, and meticulous in his habits.

The main points are: his timid and anxious temperament, his vivid recollection of the crash, the preliminary moments in which he felt no fear, followed by panic; and the subsequent persistent anxiety reactions coupled with a conditioned response to closed spaces.

Both types of reaction may occur in the same individual, as in the following instance, combining the pure traumatic effect of dream and conditioned responses plus anxiety symptoms arising out of an insecure and dependent personality in whom there is evidence presumptive of unresolved infantile conflict.

An officer, aged 36, complained of insomnia with nightmares and drenching sweats, inability to concentrate, dislike of meeting people, and a tendency to worry about everything. He had become worse since he had received notice of a posting away from his present unit, which is stationed near enough to his home to enable him to live out. His personal history was that he grew up with the feeling that he was not wanted by his mother. Her entire affection was bound up in his sister, who is now, as he says, a complete contrast to himself—"a care-free strapping girl." For the first six years of his life he was brought up by his grandmother. His father realized the mother's attitude and tried in some ways to atone for it, but, on the other hand, he was a severe disciplinarian who often beat the boy.

As a child he was nervous of being left alone. He was exposed to air raids in London during the last war and was extremely afraid of them. He walked in his sleep a great deal; on one occasion he lit a bonfire in the grounds of the house, and on another occasion he wandered down the road and was brought home by a policeman. His mother used to lock him in his room to stop this, and he experienced great terror when he woke up during his sleep-walking in his attempt to get out of his room.

At school, in his younger days, he was the butt of the others, as he was always dressed differently. He made friends readily enough and played the usual games, except for a period between 14 and 16, when he had to wear a truss. He was a good swimmer.

He has, to this day, disliked the limelight; he likes to work "behind the scenes," as he put it. In spite of this he had a successful business life, became a very hard worker and conscientious in an obsessional way, although he is not severely obsessional in his mental habits; he dislikes dirt extremely and has a distaste for untidiness. He has always been capable of self-discipline, even to a punishing extent. For example, in his boyhood he would go to early morning service at church, without breakfast, and while kneeling in church in these circumstances he fainted several times. This ardent church attendance was connected with his admiration for a prominent preacher of the time, with whom he became close friends. When the war started he became an A.R.P. warden; he experienced a considerable number of air raids without being disturbed in his efficiency and in spite of loss of sleep.

He enjoyed his work in a non-flying branch of the R.A.F., remaining fit until Jan., 1943, when he had an attack of influenza, followed by jaundice. He still felt unwell on his return to his unit, which was raided on March 9, 1943. There was a "near miss" on the hut in which he was. He remembers no fear at the time; in fact, he remembers realizing that the bomb was going to land very close and reconciling himself to what he thought was the inevitable end. He was bruised by falling debris, and remembers that he had the very greatest difficulty in preventing himself from running instead of walking to an adjacent shelter, but he slept perfectly well that night. At breakfast in the morning, however, he felt disinclined for food, and in the afternoon of the day after the bomb fell, when a siren went again, he found himself, to his surprise, very much affected, feeling extremely afraid and experiencing great difficulty in controlling himself so as not to show signs of fear in front of his brother officers. Since then he has suffered from the symptoms of which he now complains. His nightmares are not usually about bombs, but about drowning or being strangled, and he wakes up in such a profuse sweat that his pyjamas are soaked.

After this condition developed he succeeded in getting a post to a station where he could live out, at home with his wife. Previously it had not been an ordeal to be away from her, but now he found himself very dependent on her support and comfort. There were no air raids in the vicinity of his unit, but an air-raid siren went off every Sunday morning as a practice. He observed that he inevitably reacted with feelings of tension and anxiety until he reminded himself that it was not a sign of an actual air raid, and his commotion subsided to the level which is now habitual, as he described it in his symptoms.

NOTABLE POINTS IN THE ABOVE CASE

1. The patient was a good example of a child suffering from rejection by his mother, with anxiety symptoms in his childhood which were probably closely related to this situation, and with a chronic sense of inferiority, also originating in all probability in the same way. His marriage to an older woman was probably determined a good deal by lack of the maternal type of affection in his boyhood, but it should be noted that his dependence was not so extreme that he was unable to live with reasonable happiness apart from her until after the air-raid experience of March, 1943. No doubt the anxiety reactivated by this traumatic experience could be construed as separation anxiety, revived.

2. There is no question of lack of courage, since he had endured many previous air raids with success and taken an active part in the work of defence.

3. His sense of duty has some of its roots in his obsessional characteristics, which may again be related in some degree to his upbringing by an unaffectionate mother and an affectionate but severe father. His excessive conscientiousness shows itself in his reaction to his present symptoms; he says: "I am thoroughly ashamed of this—I am yellow."

4. The air raid which upset him occurred at a time when his general health was impaired and therefore his resistance, both physical and mental, lowered.

5. During that episode he had no awareness of fear of the bombs approaching, although immediately afterwards he noticed that he had difficulty in controlling the impulse of flight. It is notable, also, that he slept quite well on the following night and that there was a latent interval between the experience and the development of symptoms. Furthermore, the symptoms appeared not to develop to any disturbing extent until another stimulus occurred—namely, an air-raid warning recalling the previous experience. It is virtually certain that this air-raid warning signified to his mind, at the time, another air raid, and that, unlike the practice warnings at his new unit afterwards, it had a definite meaning of danger for him. It is to be observed also that subsequent air-raid warnings, although rapidly recognized as innocuous, continued to produce exacerbations of his now chronic emotional tension. Moreover, his symptoms of chronic tension have persisted in spite of his being away altogether from reminders in the shape of actual raids or danger of any kind.

Additional Points on Cases

1. It is notable that most R.A.F. crew members who have been involved in a flying accident seem to remember the traumatic experience vividly and in detail. This is contrary to Kardiner's observation; but his cases were of much longer standing—years, instead of weeks or months, having elapsed since the event. It is probable that hysterical processes entered far more often into the psychodynamics of his group.

2. There is, in a considerable proportion of the cases coming under my observation, retrospective evidence that there was conscious fear at the time of the occurrence. "Delayed inhibition" in the Pavlovian sense does not seem to have been the process responsible in them for the subsequent psychoneurosis.

3. It is possible that some stupors are essentially states of extreme preoccupation with the frightening experiences (cf. Hoch's (1921) *Benign Stupors* and the preoccupation with death).

4. Other stupors are presumably hysterical (avoidance) methods of dealing with the same kind of experience.

5. The long persistence of conditioned responses after trauma, up to two years in some R.A.F. cases, and probably indefinitely longer, has its parallel (Anderson and Parmenter, 1941) in sheep with experimental neuroses.

6. Some phobias, not of war origin, have probably the same kind of basis, extended to other situations recalling the original traumatic one in some way.

I have to thank Air Marshal Sir Harold Whittingham, Director-General of Medical Services, R.A.F., for permission to publish this article.

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GAS GANGRENE
WITH SPECIAL REFERENCE TO VASCULARIZATION OF MUSCLES

BY

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The various factors in the pathogenesis of gas gangrene have still to be assessed. Of these, muscle ischaemia, while generally recognized as playing a part, has not received the attention it deserves. The present paper attempts to elucidate some of the problems of surgical treatment, with particular reference to the possible effects of vascular injury in promoting gas gangrene in war wounds.

Out of a series of 6,000 wounded 20 cases of gas gangrene were encountered in this general hospital during the first two months of the fighting in Normandy. It is seldom that the surgeons of a large general hospital have had the opportunity provided in this beach-head of seeing their patients within six to eight hours of wounding, of undertaking the primary surgery, and of observing the sequence of events at first hand from day to day. Adequate notes are available in 16 of the 20 cases encountered, and in only one of these had the initial operation been undertaken at a forward C.C.S.

Three factors are essential for the establishment of gas gangrene—the presence of pathogenic clostridia, an adequate mass of ischaemic or necrotic muscle, and delayed or faulty surgery. The first two are unavoidable, and can be effectively countered only by early adequate surgery. When casualties are heavy it is impossible to operate on all cases within the optimum period, but if those likely to develop gas gangrene are given priority it would go a long way towards eradicating this disease. Apart from gross destruction of a limb, gas gangrene is most lethal in the thigh and buttocks, and all cases of shell wound in these areas should be given operative priority.

Muscles are supplied by one or more arteries. Should one of these be injured, then that part of the muscle supplied by the injured vessel becomes ischaemic. When this occurs the re-establishment of the collateral circulation within the muscle appears to be extremely slow, and in open wounds invariably results in necrosis. This not only is borne out by my own operative experience, but has recently been proved experimentally in rabbits by Le Gros Clark (1945). He states: "After ligature of the lower vessel of supply to the tibialis anticus . . . the normal vascularization of the lower half of the muscle is not restored for about a week. If both of the main vessels supplying the tibialis anticus are ligatured revascularization is delayed for a fortnight." And again: "In spite of anastomotic connexions, the interruption of one vessel of supply to a muscle (or one of its branches) may lead to a relatively extensive and well-defined area of ischaemia lasting for several days. This is important in relation to the infection of muscles in war wounds." I would go further and state that, combined with the presence of clostridia, it invariably results in gas gangrene.

I have stated that sufficient ischaemic or necrotic muscle is essential for the establishment of gas gangrene, and the following examples illustrate this. In the first, a small ragged piece of shell passes through the thigh, causing no arterial damage, it leaves in its wake a tract thinly lined with avascular muscle. Such cases, whether operated upon or not, will not develop gas gangrene: natural resources can cope with such damage. Now if a similar piece of shell passing through the thigh should strike an artery—say the profunda femoris—we have a very different picture. Two groups of muscles are rendered ischaemic and form a suitable pabulum for micro-organisms. If clostridia are present in such a wound gas gangrene will be extensive and rapidly fatal; only early adequate surgery can be life-saving. On the other hand, should a smaller artery be lacerated—say one of the perforating branches of the profunda femoris—then a more limited area of muscle is rendered bloodless. In such a case gas gangrene, if it develops, will be less extensive and not so rapidly fatal. Such examples are often met with in war surgery, and they illustrate the paramount importance of the total exploration of all shell wounds, however small.

A surgeon who fails to remove significant quantities of ischaemic muscle is guilty of faulty surgery, for gas gangrene is very likely to develop. The thigh is more sinned against in this respect than any other part of the body, and failure to carry out adequate surgery in this region has been responsible for most of the recorded cases of gas gangrene in this war. Muscle deprived of its blood supply for six to eight hours dies. If operation has not been undertaken within this period all blood-less muscle must be excised. If one group of muscles is avascular it should be removed; if two groups are involved the limb should be amputated.

Of the 16 cases under review 14 occurred in the lower limb and 2 in the upper. The disparity is accounted for by the more abundant arterial anastomosis of the arm and by the relative vulnerability of the leg owing to its greater mass. It will be found that the cases come under two distinct categories—namely, massive gas gangrene resulting from damage to the main artery of a limb, and localized gas gangrene (in the early stages) resulting from laceration of muscular branches. Several of each type occurred in the lower limb and one of each in the upper, as tabulated below. There were two deaths, both resulting from gas gangrene following injury to the popliteal artery.

	Main Arterial Damage	Injury to Muscular Branches
Upper limb	1	1
Lower limb	7 (two deaths)	7

Upper Limb

1. *Case of Main Arterial Damage.*—Cpl. A. was wounded in the abdomen and right elbow on June 29, 1944. He was in a forward position, and was not rescued till the morning of July 2—60 hours after being wounded. On admission to hospital the same day his condition was fair. He had an intestinal fistula and did not complain of abdominal discomfort. There was a foul-smelling wound on the anterior aspect of the elbow, the skin was mottled, and the arm above and below the elbow was greatly swollen. Rigor mortis

had set in in the hand; it was impossible to move any of the fingers. Amputation above the elbow was carried out the same day; the abdomen was not disturbed. On exploration of the amputated limb the radial and ulnar arteries were found to have been severed just below the bifurcation of the brachial artery; anaerobic myositis was found in the muscles of the upper forearm.

If the radial and ulnar arteries are severed below the recurrent branches the forearm is cut off from all blood supply and early amputation should be performed: two similar cases were encountered in which both arteries had been ligatured and amputation was carried out later. Ligature of the brachial artery, on the other hand, does not necessarily endanger the life of the limb: in three cases the artery was ligatured in the region of the elbow, and in all of them the limb survived.

2. *Injuries to Muscular Branch.*—L/Cpl. B. sustained a shell wound on the outer aspect of the arm on July 18, 1944. The entry wound was small; there was no exit wound. When seen, 20 hours later, gas gangrene was well established. On opening up the arm the long head of the biceps was completely gangrenous and was the only muscle involved; it was removed *in toto*. The upper tendinous part was first cut through and the muscle dissected out towards the elbow. On reaching a point about the middle of the arm, where the shell fragment had pierced the muscle, an artery was encountered. It was a branch of the brachial, which, having passed through the short head of the biceps, was entering the substance of the long head. It had been severed by the missile, thereby depriving the muscle of its blood supply. No other artery entered the muscle.

This case is a good example of the complete death of a single muscle followed by early gas gangrene. I saw a similar case in the biceps in the North African campaign; but it is the only single muscle in which I have encountered complete destruction, and this is accounted for by the fact that it is supplied by a single artery.

Lower Limb

Cases of Main Arterial Damage

Seven cases of gas gangrene come under this heading. Five resulted from injury to the popliteal artery and two to injury of the dorsalis pedis. As the history is very similar in each case they will not be recorded in detail.

Injuries to the main blood vessels of the lower limb are a most potent cause of gas gangrene, and in my experience almost invariably result in amputation. In the series of 6,000 cases there were 9 in which the popliteal artery was injured; in every case amputation had to be performed. Out of four cases of ligature of the femoral artery three resulted in amputation. Should gas gangrene supervene in such cases it is very rapid, and often fatal within 24 hours on account of the vast area of muscle involved. When a main artery has been ligatured in the leg the patient should be watched hourly and amputation performed at the first sign of clostridial infection. Particularly dangerous is the case in which the femoral artery has been ligatured and there is an additional wound of the lower leg; in such a case primary amputation should be carried out. Severance of the anterior tibial artery is more prone to cause gas gangrene than the posterior tibial, for in the calf the peroneal artery can carry on the circulation. If the anterior tibial artery requires ligature its muscles below this point are ischaemic and should be removed.

The thigh is the most interesting site in the body for the study of gas gangrene, and an intimate knowledge of the vascular supply of the muscles is of paramount importance. The muscles of the upper part of the thigh are supplied by arteries emerging from the pelvis, and those of the lower thigh by the profunda femoris and its branches. Should the femoral artery be injured below the origin of the profunda femoris it is the lower leg which is temporarily deprived of its blood supply, and dry gangrene may ensue. The muscles of the thigh are unlikely to be involved by gas gangrene owing to their receiving a normal blood supply by way of the profunda femoris.

Wounds of the popliteal artery present a very different picture, for after ligature of the vessel the calf muscles exposed in the wound are avascular and gas gangrene is more likely to occur. Once clostridia gain an entry the spread down the leg muscles is only a matter of hours, and as large masses of muscle are involved the toxaemia is extreme and rapidly fatal. Exploratory incision of the popliteal fossa should therefore not extend further down the limb than is absolutely necessary. The larger the wound the more avascular muscle is exposed; it is a happy hunting-ground for micro-organisms, and the danger of gas gangrene is greatly enhanced.

The site at which the popliteal artery is ligatured is of considerable importance. If the injury is above the origin of the inferior geniculate arteries the collateral circulation may prove sufficient, but, should it be below, the collateral circulation is most precarious. Only two very insignificant arteries are available—the anterior and posterior tibial recurrent. Of these the latter is inconstant, while the former is very small and incapable in itself of establishing the collateral circulation.

A wounded soldier seldom comes to operation under six hours. By that time muscle necrosis is setting in if arterial damage is present. On approaching a wound of the popliteal artery one should first ascertain if the circulation below the knee is adequate. If the foot and leg are warm operation should be postponed, for interference with the artery may cause spasm, as illustrated by the following case:

Pte. C. sustained a shell wound of the posterior aspect of the knee on July 11, 1944. He was admitted to hospital the next day; there was a small haematoma in the calf. The foot was warm and the dorsalis pedis pulsating; injury to the popliteal artery was not suspected. On account of the swelling of the knee-joint it was thought advisable to explore the wound to ascertain if the joint had been penetrated. The wound was enlarged and the blood-clot was evacuated. The popliteal artery was found severed above the inferior geniculate arteries, and was ligatured. Pulsation in the dorsalis pedis ceased. Gas gangrene was present in the lower limb next day, and although amputation through the thigh was carried out the patient died. If the operation had been postponed until the collateral circulation was more fully developed the chances of survival of the limb and the patient would undoubtedly have been enhanced.

If the limb is cold and pulsation is absent in the dorsalis pedis, then treatment depends on whether the injury is above or below the inferior geniculate arteries. If it is above, then the probable explanation is arterial spasm. The wound should be explored and the damaged segment of the artery excised and the artery ligatured. On return to bed vasodilatation should be encouraged by hot drinks, heat to the uninjured limbs, and alcohol. Smoking, which has a vasoconstrictor action, should be forbidden. There should be no external pressure on the limb in the form of encircling plaster or bandage. The limb, if fractured, should rest on a Thomas splint with light traction. Heat is contraindicated; it increases oxygen demands, so hastens the onset of gangrene and favours the growth of pathogenic organisms. The limb should be exposed to the air or packed in ice. Should the injury be below the origin of the inferior geniculate arteries, then there is but one course—amputation of the limb.

The remaining two cases of injury to the main artery causing gas gangrene occurred in the dorsalis pedis, with much destruction of tissue; gas gangrene was present on the dorsum of the foot.

Injury to Muscular Branches

Damage to the smaller arteries and to those of individual muscles is particularly interesting and important in the thigh. The profunda femoris is the main source of supply to the muscles in this region. Its lateral circumflex branch supplies the greater part of the quadriceps; the main artery itself supplies the adductor and hamstring group of muscles. If either is injured muscle ischaemia will be extensive. This artery is liable to injury in fractures of the femur, especially when the bone is comminuted by a missile entering from the lateral side. In the great majority of compound fractures of the femur in war this artery escapes injury, so ischaemia will be limited to the torn and ragged muscle in the vicinity of the fracture, and gas gangrene is most unlikely to develop. If, on the other hand, the artery is injured high up in the thigh, the adductor and hamstring group of muscles are almost wholly deprived of their blood supply; in which case primary amputation should be performed, for gas gangrene is apt to be extensive and rapidly fatal. When the injury is lower in the thigh, more limited areas of muscle are involved and local excision may suffice. This artery is the key-note to gas gangrene in the thigh, and a thorough knowledge of its distribution is essential to successful surgery. In carrying out débridement of a wound it is important not to injure the profunda femoris or its branches;

when this occurs the patient returns to bed with a fresh mass of ischaemic muscle, in which gas gangrene is most likely to develop. There is nothing more disturbing to a surgeon than to find clostridial infection 48 hours after a well-done operation.

The seven cases of injury to muscular branches are of particular interest and will be recorded in detail; comments as to the vascular distribution will be made in each case. All underwent operation about the 24-hour period, and, as only localized areas of muscle were involved, generalized symptoms were not far advanced. They were diagnosed by the presence of clostridia and the typical "deadhouse" smell.

Gdsmn. D. was wounded on July 30, 1944, and admitted to hospital the next day with a wound in the buttock. Early gas gangrene was present in the upper part of the gluteus maximus; all gangrenous muscle was excised. The missile had pierced the muscle in the region of the greater sciatic foramen. During the operation the superior gluteal artery was sought for as it emerged from the pelvis; its superficial branch was found to have been severed.

The gluteus maximus is a large muscle and is supplied by several arteries. The superficial branch of the superior gluteal supplies the upper portion, the inferior gluteal the middle portion, and the lower part of the muscle is supplied by the first perforating branch of the profunda femoris and the medial circumflex arteries. The superficial branch of the superior gluteal artery having been severed in this case, the upper part of the muscle underwent necrosis, and gas gangrene resulted. If the missile had severed the superior gluteal artery gas gangrene would have been much more widespread. This artery is practically the sole supply to the gluteus medius and minimus, and both these muscles would have been involved. It is common knowledge that certain buttock wounds may result in serious gas gangrene, and I believe this is the explanation.

L/Cpl. E. was wounded by a shell fragment on July 10, 1944, and admitted to hospital next day. There was a large foul-smelling through-and-through wound in the upper thigh medial to the femur. On enlarging the wound an extensive amount of gangrenous muscle was found, involving the adductores brevis, longus, and magnus, also portions of the semitendinosus and semimembranosus; it was confined to the region of the mid-thigh. The profunda femoris artery was severed in the region of its second perforating branch. All necrotic muscle was removed.

Gnr. F. sustained multiple shell wounds of the left calf on July 14, 1944. On admission next day the calf was swollen and foul-smelling. On exploration of the wound the gastrocnemius was found to have been traversed by a missile from the lateral to the medial side and about 3 in. below the knee; muscle injury was extensive. The part of the muscle distal to the track was gangrenous. No particular arterial damage could be found, but one concludes that the sural arteries, as they run down in the substance of the muscle, must have been severed, thereby depriving the muscle beyond this point of its blood supply.

Prisoner of War G. was admitted on July 24, 1944, with an antero-posterior through-and-through wound of the mid-thigh lateral to the femur. On exploring the wound a mass of early gangrenous muscle was found, involving the middle third of the vastus lateralis and vastus intermedius, also a small portion of the lateral border of the rectus femoris. The track of the missile was in the vicinity of the descending branch of the lateral circumflex artery; this artery was sought for and found severed.

The vastus lateralis and vastus intermedius are supplied by three arteries—the upper third by the transverse branch of the lateral circumflex, the middle third by the descending branch of the lateral circumflex, and the lower third by the lateral superior geniculate arteries. The rectus femoris gets part of its blood supply from the descending branch of the lateral circumflex. In this case the descending branch of the lateral circumflex was severed near its origin, thereby depriving part of the above-mentioned muscles of their blood supply, and gas gangrene supervened.

Spr. H., admitted on July 18, 1944, was in similar case to the above, except that the descending branch of the lateral circumflex was injured lower down; the gangrenous area was thus far more limited.

Pte. I. was admitted on July 26, 1944, with multiple shell wounds of the posterior aspect of the thigh. On exploring the wound the semitendinosus was found gangrenous except at its upper end; all gangrenous muscle was removed.

The semitendinosus has a dual blood supply. The upper part is supplied by the medial circumflex, and the main body of the muscle by a branch of the second perforating artery. This artery divides into two branches—one supplies the sem membranosus and the other the semitendinosus. On remov the main body of the muscle this last artery was not locate it had evidently been severed by a missile.

Pte. J. was admitted on July 26, 1944, with multiple shell wou of the left thigh; his case was similar to the above, but, in addi to the semitendinosus, the semimembranosus was also gangreno Both muscles were partially removed.

The semimembranosus, in addition to being supplied by terminal branch of the second perforating artery, is also su plied by the third and fourth perforating arteries after th pierce the adductor magnus. The point where the second pe forating artery divides into its terminal branches is very clo to the third perforating artery as it emerges from the adduct magnus; so that a missile is very apt to injure both arteries, a occurred in this case.

Discussion

The distribution of clostridia is widespread. Cutler a Sandusky (1944) found the incidence of clostridial contamin tion in aerial warfare as great as that of land warfare and th of accidental civilian wounds. I have seen an Italian sail come off a ship with well-established gas gangrene. Th clostridia can be grown from the skin (Roberts, Johnson, a Bruckner, 1933) as well as from wool (Schenken, quoted Mais, 1940). It can be grown almost without fail from t battle-dress. MacLennan (1943) states: "Their absence fro war wounds is a matter of surprise rather than satisfactio their presence, for resignation rather than alarm." There st exists a fallacious belief that direct contact with the soil is t chief causal factor in the establishment of gas gangrene; t Cutler and Sandusky findings must surely stamp this out fo ever. It is the clothing that is the important vehicle, especial the battle-dress, which is largely composed of wool. Tropic kit, being made of cotton, does not harbour the clostridia the same degree, and should there be an increase of gas ga grene in the European theatre of war in excess of the dese campaign this will probably be the explanation.

MacLennan has shown that in the desert warfare 30% of a wounds contained the organism of gas gangrene, yet only 1 of those so contaminated developed anaerobic myositis. Wh is the percentage so small? The answer undoubtedly is th in only 0.33% of all wounds has arterial damage been inflicte and a sufficient amount of ischaemic muscle produced in whic the clostridia can multiply.

We must resign ourselves to the fact that many war wound are contaminated with clostridia, and that, provided ampl necrotic muscle is present, gas gangrene will ensue. Earl reports on penicillin would indicate that it is powerless to ste the progress. At present the elimination of gas gangrene ca come only from early and efficient surgery, which can be greati aided by a thorough knowledge of the blood supply of th muscles.

I am indebted to Col. T. F. Arnott, O.B.E., T.D., commandin a general hospital, for permission to publish this paper.

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The Joint Consultative Council of institutions recognized by th Minister of Health for the training of health visitors, and of organ izations of health visitors, has issued its report for the year 194 from 7, Victoria Street, London, S.W.1. The council, whose chai man is Prof. Winifred Cullis, D.Sc., originated in a conference representatives of training institutions convened by the Wome Public Health Officers' Association in November, 1931, and w formally constituted in January, 1932. During the last 14 years has been a useful means of conveying the conclusions of its membe to the Ministry of Health, the Royal Sanitary Institute, and oth bodies, on matters affecting the training and examination of heal visitors, and has been responsible for five publications based independent inquiry. An inquiry into the alleged shortage of heal visitors in 1941 was conducted by the Joint Consultative Counc but the results were not published. Though the position has alter since then, there was in 1941 no acute or general shortage of heal visitors.

ARSENICAL ENCEPHALOPATHY

NOTE ON THE CONDITION STRESSING THE VALUE OF POSTURAL TREATMENT, WITH CASE RECORDS

BY

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During an 18-months period—April, 1943, to Sept., 1944—in an area where malaria is hyperendemic and its cerebral manifestations severe and often fatal, it was expedient for us to form a "coma team" analogous to Sir Leonard Rogers's cholera team. This team has treated, in a small ward equipped for the purpose, 155 cases of fully developed coma attributable to malaria in Indian other ranks and camp followers. In addition to malarial coma, cases of coma due to such causes as uraemia, cholaemia, etc., and on five occasions following the injection of arsenicals, have been seen. That these five patients recovered, while at the same time the majority of similar cases occurring in other units terminated fatally (Davies, 1944), is attributed by us to the use of postural treatment in nursing. Support for this assertion, though not conclusive, may be drawn from the fact that in another hospital five cases treated on orthodox lines ended fatally; a sixth case was seen by one of us (J. C. S. P.) some hours after the onset of coma with convulsions. This patient finally recovered on the adoption of the method of treatment outlined below.

Originally devised to prevent the onset of pulmonary oedema, so common in malarial coma, nursing these patients in the sitting posture not only was found to prevent the onset of pulmonary oedema but appeared significantly to modify the depth of coma and the final outcome. The rationale of this procedure is dealt with in the discussion. We will here give a brief description of the condition and our method of treatment.

Description of the Condition

Arsenical encephalopathy—synonyms of which are arsenical cerous apoplexy (Lees, 1937), arsenical haemorrhagic encephalitis, and arsenical encephalorrhagia—has occurred in 1.3% of the patients treated for syphilis by the rapid five-day method of administration of mapharside, and has been found to occur in the Army, using neoarsphenamine, and particularly in Tamil patients, with sufficient frequency to merit the most serious attention of all medical officers.

The following description of the pathology is that of Kinnier Wilson (1940). Perusal of the recent literature, of current textbooks, and of fatal case-sheets has added but little to his account of the clinical and histological features.

According to the English Salvarsan Committee's Report,[1] about 50% of "salvarsan deaths" in all countries have been due to a "haemorrhagic encephalitis," distinguished by abundant small perivascular effusions (mostly of the ring type), plugged capillaries with minute necrotic zones around them, and sometimes incomplete parietal occlusion in larger vessels; on occasions these thrombi are hyaline (Lissauer,[2] von Marschalko,[3] Scott and Moore[4]). Interstitial reactions otherwise (cellular infiltration of vessel coats rather than of perivascular spaces) are never pronounced and frequently lacking.

Multiple minute capillary and pericapillary lesions of this kind, with hyaline thrombosis, are found also in carbon monoxide poisoning and narcosis, and were observed during the war in phosgene-gas cases. They occur, too, in cerebral malaria, fat embolism, and other disease conditions.

Subpial extravasation may accompany the cerebral, which is often well seen in optic thalami, cornu Ammonis, tegmentum, pons, and elsewhere (Scott and Moore, Globus and Ginsburg,[5] Pollak and Riehl[6]). At times, however, nothing more than congestion and oedema is discovered (Obermiller,[7] Stuhmer[8]). Moderate demyelination round haemorrhagic zones was remarked by Strauss and Globus.[9]

[1] M.R.C. Rep., No. 66, 1922 (lit.).
[2] *D.m.W.*, xliii, 1917.
[3] Ibid., xxxviii, 1912.
[4] *A.J.S.*, 1928.
[5] *A.N.P.*, xxx, 1933.
[6] *Jahrb. P.N.*, xlvii, 1930.
[7] *B.k.W.*, 1, 1913.
[8] *M.m.W.*, lxvi, 1919.
[9] *J.N.M.D.*, lxxv, 1930.

Examination of the cerebrospinal fluid shows that initially the pressure is normal. Later, as secondary cerebral oedema sets in, the pressure tends to rise. This also occurs in cerebral malaria. Protein varies from 40 to 300 mg. per 100 c.cm. Globulin is increased, but less so than in infective conditions—e.g., acute anterior poliomyelitis. The cells are usually normal; rarely are there red blood cells.

Aetiology

The causal factor is unknown. Apparently it is (1) not related to the arsenic radical, since poisoning by inorganic arsenic does not give rise to cerebral symptoms (Halcrow, 1943); (2) not related to dosage (Anwyl-Davies, 1941) (nevertheless the high incidence in the rapid mapharside method of treatment must be kept in mind); (3) not due to the Jarisch-Herxheimer reaction, since arsenical encephalopathy has occurred in non-syphilitics (Lees, 1937; Glaser, Imerman, and Imerman, 1935).

There may be some relationship to arsenical purpura—the disintegration of the arsenobenzene compounds in the blood being a possible factor (Halcrow, 1943). Further investigation of this is required. The tourniquet test, bleeding time, and platelet counts should be done in all cases; the very few that we have done so far have been normal.

The fact that recent cases have been described as occurring during pregnancy (Tzanck and Lewi, 1939; Nelson, McGibbon, and Glyn-Hughes, 1943), and the high incidence in Tamils (Davies, 1944), suggest the possibility of a protein or other dietetic deficiency. The work of Vail (1941) on the increased sensitivity to arsenic in the presence of hypovitaminosis-C, and of Horne and Scarborough (1940) on the value of hesperidine (vitamin P) in the treatment of arsenical purpura, is of the greatest interest in this connexion.

Symptomatology

Signs and symptoms usually appear after 2 to 4 injections of the first course of treatment, and may be associated with irregularity in treatment. They begin 1 to 4 days after the last arsenical injection—commonly the second—when headache, vomiting, and delirium are succeeded by deepening coma, a rising temperature, and death. Focal lesions, such as Jacksonian fits, facial palsy, external and internal ophthalmoplegias, have all been observed, as has also a meningitic reaction, although rarely. In cases which recover there may be transient mental and bizarre neurological pictures. These normally pass off after a few days.

Relation of Symptoms to Lesions.—The stage of irritability, headache, fits, and nausea corresponds to the initial vascular lesions. Deepening coma and death appear to be due to acute reactive oedema of the brain.

The average mortality rate is 75% (Kinnier Wilson). In recent literature 34 cases have been described, with 25 deaths; the mortality rate in military practice seems to have approximated this figure.

Diagnosis

Diagnosis may be facilitated by checking the field service card (IAFM 1272), usually carried in the pay-book, and by looking for needle marks in arms and buttocks. Cases are sometimes mistaken for other forms of encephalitis, cerebral malaria, cerebrospinal meningitis, benign lymphocytic meningitis, poisoning by drugs, alcoholism, epilepsy, and hysteria. Of these, in view of the fact that cerebrospinal meningitis will be excluded by lumbar puncture, cerebral malaria is by far the most important, and if the patient comes from a malarious area he must always be rigorously treated for this, irrespective of whether the clinician thinks that the case is one of arsenical encephalopathy or not.

Arsenic and Malaria.—There is evidence to show that the organic arsenicals can reactivate latent malaria, and cases of cerebral malaria have been recorded in which there were negative blood slides and positive brain smears after arsenical administration (Castellani, Marinesco, and Draganesco; quoted by Anderson, 1927). One so-called case of "arsenical encephalitis" in this army, which received no antimalarial therapy, was proved later to have been malarial in origin.

Principles and Practice of Treatment

The principles of treatment are: (1) to prevent, so far as is possible, the onset of secondary cerebral oedema and exudation through damaged capillaries; (2) to inactivate circulating arsenical drugs; (3) to observe the principles of nursing coma cases; (4) to anticipate complications—e.g., hyperpyrexia, convulsions, pulmonary oedema, pneumonia; (5) in malarious areas and in patients who have returned from malarious areas, treatment must be as for cerebral malaria.

Oedema of the brain in the past has been successfully relieved by repeated lumbar punctures combined with venesection. In view of the fact that in the prone position venous and hence capillary pressures are 80 to 100 mm. of water, while in the sitting patient they are negative to atmospheric pressure, "decongestion" can be achieved simply by nursing the patient sitting up, using a back-rest. The cerebrospinal-fluid pressure at ventricular level then drops to atmospheric level or less.

Postural nursing is the greatest single factor in saving life, and should be used in every case from the onset.

Lumbar puncture should be done initially for diagnostic purposes and the pressure, if raised, reduced to 100 mm. of water. This should be repeated if in spite of postural nursing the coma appears to deepen. A cisternal puncture is often more convenient.

Dehydration of the brain is indicated only if the coma is deepening in spite of postural nursing and lumbar punctures. It is done as for head injuries: (i) Concentrated serum albumin, 25% solution intravenously (U.S. Naval package: 25 g., equal to 450 c.cm. of plasma), is the method of choice. (ii) Failing the above, concentrated glucose-saline as supplied by the Army, 60 to 120 c.cm. intravenously, or hypertonic glucose solution (or sucrose, if available) by slow drip infusion.

Sodium or calcium thiosulphate given intravenously in 0.5-g. doses once or twice daily is of doubtful value. Calcium gluconate and vitamin C may influence capillary permeability. Adrenaline is of doubtful value. Drugs for the purpose of detoxicating the organic arsenicals—the experimental work on which was reviewed in an editorial in the *Journal* (1943, **2**, 681)—have not been used by us, but to be of value they would have to be employed early in the disease process. This is not always feasible, since many of the patients are first seen after coma has developed; but the method might have been applied with advantage to our Case 3.

Complications.—Pulmonary oedema is largely avoided by posture. *Hyperpyrexia* is anticipated by routine rectal temperatures and dealt with by tepid sponging and fanning. *Convulsions and restlessness* should receive ruthless treatment. For fits, hexobarbitone sodium followed by paraldehyde by mouth, or sodium phenobarbitone 6 gr. intramuscularly, is indicated. It cannot be stressed too strongly that patients should not be allowed to have fits, because they raise the cerebral capillary pressure in capillaries whose endothelium has already been damaged. *Adequate antimalaria therapy* should be given, as outlined in the "Blue Book" for pernicious cases.

Summary of Treatment.—(1) Examination of the patient. (2) Lumbar puncture. (3) Sit the patient up on a back-rest. (4) Treatment of complications—e.g., pulmonary oedema, fits, hyperpyrexia, etc. (5) Adequate antimalaria therapy. (6) Calcium or sodium thiosulphate i.v., 0.5 g., with calcium gluconate and vitamin C if available (of doubtful value). (7) Adequate hydration and nutrition by transnasal intragastric Ryle tube left *in situ*.

Case Notes

Case 1.—An Indian sepoy, aged 25, was admitted to hospital on the evening of March 31, 1944, deeply unconscious: 1½ hours before admission he had felt giddy and had fallen down unconscious, bringing up blood-stained frothy sputum. On March 5 he had a sore on the penis, and dark-field examination showed *T. pallidum*. Treatment had consisted of three injections of N.A.B. and bismuth, the last injection having been given on March 27. On admission he was in deep coma, responding only to painful stimuli, with stertorous breathing and frothing at the mouth (not blood-stained). The eyes were half opened, with a vacant stare. The general attitude was that of midbrain posture, arms adducted and flexed across the trunk, elbows and wrists flexed and supinated, fingers semiflexed, and lower extremities extended at all joints. There were tonic spasms lasting two to three minutes, associated with stertor, trismus, some opisthotonos, ocular deviation to the right, and an accentuation of the position, described above. During the resting phase of similar duration, the arms were often extended and athetoid movements of the fingers were present. A sucking reflex was also elicited at this stage. Just before the height of the tonic phase, flexion of the head to one side produced relaxation of the contralateral limbs (Magnus and de Kleijn reflex). Grasp reflex absent; deep reflexes all present and exaggerated; ankle clonus present; plantars extensor and abdominals abolished. Muscle tone appeared normal as did crude position sense. Conjunctival and pupillary reflexes and swallowing reflex present. C.S.F.: Cells less than 10/c.mm., proteins, 60 mg./100 c.cm.; chlorides, 720 mg./100 c.cm.; sugar normal; pressure, no increase. W.B.C., 11,600/c.mm.—polymorphs 54%, lymphocytes 44%, monocytes 2%. Treatment was as described above. April 1: Still in deep coma; urinary incontinence; temperature rose in the evening to 104° F. April 2: Coma lighter; patient easily roused by questioning; plantar reflexes became flexor. April 3: Conscious; B.P. 136/74; still incontinent. April 4: No incontinence. Recovery uneventful.

Case 2.—A Sikh, aged 19, was admitted to hospital on April 15, 1944, deeply unconscious. Five days previously he had received the third injection of N.A.B. for sero-positive syphilis. He was very restless on admission, but when still, lay on his back in a position similar to that of Case 1. There was increased tone in all the limbs, with a tendency to spasmodic arching of the trunk, when the neck became rigid. During the intervals between the spasms the neck was so relaxed as to enable the chin to touch the chest wall. Kernig's sign was negative. Superficial reflexes all present; abdominals brisk; deep reflexes exaggerated and equal on both sides. Spontaneous jaw clonus; no ankle clonus; plantars flexor. Pupils slightly dilated and eccentric; reaction to light sluggish. No facial paralysis. Respirations regular, rapid, rattling. No cyanosis. No engorgement of veins. Skin: secondary rash present. Healed sore on penis. Pulse 140/min.; B.P. 139/70; rectal temperature 103.2°. Following treatment he became conscious 42 hours after admission. For the next few days his cerebration was slow but speech was unaffected. Improvement was rapid, and he was discharged for further convalescence on May 5.

Case 3.—A Tamil pioneer, aged 20, was admitted to the V.D. ward on June 6, 1944, suffering from balanitis and penile sore. Two days later dark-field examination revealed *T. pallidum*. An syphilitic treatment was given as follows:

June 15: N.A.B., 0.3 g.; bismuth, 0.1 g.
,, 19: N.A.B., 0.3 g.; bismuth, 0.2 g.
,, 22: N.A.B., 0.45 g.
,, 26: Bismuth, 0.2 g.

On June 26 he complained of headache and had slight fever, no arsenic was given. A blood film showed no malaria parasite. He made no complaint in the evening, and remained well during the next day, although his temperature in the evening rose to 99.4°. On June 28 he was well early in the morning, but at 11 a.m. suddenly developed a rigor with twitching, and by midday was in deep coma, responding only to noxa. Temperature 102° F.; pulse 144/min.; respirations 18/min. Pupils were dilated, reacting sluggishly to light. No neck rigidity. Deep reflexes all present but sluggish. Conjunctival, abdominal, and cremasteric reflexes abolished. Plantars indefinite. Heart, lungs, and abdomen: N.A.D. No fulness of neck veins. Urine normal. C.S.F.: Pressure, 135 mm. of water; clear; cells 4/c.mm.; protein, 40 mg./100 c.cm.; chlorides 750 mg./100 c.cm.; sugar, normal. Treatment on the line described was started, and on the following morning the patient was drowsy, but responded to touch and to questioning. On June 30 he was fully conscious, and thereafter recovery was uneventful.

Case 4.—A Tamil pioneer, aged 22, was admitted to hospital on June 16, 1944, at 11.00 hours, unconscious and having fits. His history was that he had suddenly become unconscious at 10 hours. On June 2 sores appeared on the penis. Dark-field examination showed *T. pallidum*, and treatment, with N.A.B., was as follows: June 5, 0.3 g.; June 8, 0.3 g.; June 12, 0.45 g. Temperature on admission was 99.2° F.; pulse 96/min.; respirations 24/min. The patient was lying on his back with his lower extremities extended and frequently rolled over on his side with his legs drawn up. His arms were moving about in front as if he was trying to grasp some object. Pupils dilated, equal, and reacted sluggishly to light. Conjunctival reflexes present. There was photophobia. Deep reflexes present; abdominals lost; plantars extensor; and ankle clonus present. Nothing abnormal in heart, lungs, and abdomen. C.S.F. Pressure, 120 mm. of water; clear; cells less than 10/c.mm.; protein, 300 mg./100 c.cm.; chlorides, 600 mg./100 c.cm. Urine normal. W.B.C., 8,000/c.mm.—polymorphs 77%, lymphocytes 21%, monocytes 2%. Treatment was given on the above lines, and on the morning of June 17 he was still deeply comatose, responding only to painful stimuli, though the depth of coma lightened towards midday. On the 18th the depth of coma was variable, and the patient became fully conscious the next day. Temperature became normal on June 21, and thereafter the patient remained well, without nervous residua.

Case 5.—A Central Provinces pioneer, aged 18, was transferred from the V.D. Dept. on Sept. 1, 1944. He was a case of sero-positive syphilis, and had received treatment as follows:

Aug. 19: N.A.B., 0.3 g.; bismuth, 0.1 g.
" 21: N.A.B., 0.15 g.; bismuth, 0.2 g.
" 24: N.A.B., 0.3 g.
" 28: N.A.B., 0.15 g.; bismuth, 0.2 g.
" 31: N.A.B., 0.15 g.

On transfer the patient was in coma, with the eyes wide open and face congested. There were spontaneous movements of both upper limbs. No neck rigidity. Pupils were equal, central, and reacting to light. Fundus examination showed blurring of the disks, more marked on the left, with congestion of the veins. Deep reflexes present; superficial reflexes absent; ankle clonus present; plantars flexor. There was a macular rash all over the body. Temperature 101.8° F. Heart, lungs, and abdomen: N.A.D. C.S.F.: Pressure, 70 mm. of water; fluid clear; chemically normal. W.B.C., 5,600/c.mm.—polymorphs 75%, lymphocytes 24%, monocytes *nil*, eosinophils 1%. Treatment was given as in the previous cases, and on the following day (Sept. 2) he was still in coma. Plantars indefinite. In the evening the patient became irritable and resented examination. The plantars became extensor. On Sept. 3 he was conscious but dazed. He answered to his name, but still resented examination. Plantars flexor. On Sept. 4 the patient was fully conscious, and thereafter convalescence proceeded normally.

Discussion

In view of the fact that once capillaries are damaged exudation into the surrounding brain substance is likely to occur, earlier writers (Lees, 1937; Harrison, 1937) have advocated venesection (to reduce congestion), dehydration with hypertonic saline solutions, and lumbar puncture. Cerebral oedema undoubtedly does occur, and is of the interstitial type accompanying head injuries; it is not necessarily associated with a raised intracranial pressure, provided there is free cerebro-spinal-fluid absorption. This type of oedema occurs in cerebral contusion and malarial and other encephalopathies.

Cobb (1936) has clearly outlined the physiological mechanism of the cerebral circulation, and notes the following points:

Hydrostatic Factor.—"There is a falling gradient of pressure from artery to vein, steepest in that part of the curve which represents the arteriole. Changes in arterial pressure have very little immediate and direct effect upon capillary and venous pressure, whereas changes in venous pressure affect capillary pressure immediately and conspicuously; in fact, venous and capillary pressures change equally and synchronously."

Osmotic Factor.—"The capillary wall, being a semipermeable membrane . . . is permeable to all the important osmotically active dissolved substances of the blood except protein, so normally plasma protein tends to prevent movement of fluid out of the vessels. In the arterial capillary bed the hydrostatic pressure is greater than the opposing osmotic pressure of the plasma proteins. Therefore a protein-free fluid is filtered into the tissue spaces. On the venous side of the capillary bed, moreover, the hydrostatic pressure is less than the osmotic pressure of the plasma proteins, and the fluid is reabsorbed. . . . Any obstruction to venous flow, however, will raise the venous and capillary pressure to levels well above the osmotic pressure of the plasma proteins. Filtration from the plasma to tissue spaces will now take place throughout the capillary bed, whereas no real absorption into capillaries is possible; oedema results."

Effects of Posture.—(1) In the horizontal position the venous pressure measures 8 to 15 cm. of water. In the sitting position the cerebral venous pressure becomes negative to atmospheric pressure. (2) In the horizontal position the C.S.F. pressure is roughly equal throughout the ventriculo-subarachnoid system (100 to 160 mm. of water). In the sitting position the intracranial pressure becomes negative to atmospheric pressure, while the pressure in the lumbar region nearly doubles.

The following table is an attempt to show what we conceive will happen on sitting the patient up; theoretically, the sitting posture should tend to prevent the onset of cerebral oedema (cf., elevation of a traumatized limb to prevent swelling).

Posture	Osmotic Pressure of the Plasma Proteins (mm. Hg)	Venous Capillary Pressure (mm. Hg)	Mean Reabsorption Pressure (mm. Hg)
Horizontal ..	25	12	13
Sitting	25	Approximates nil	Approximates 25

Finally, in presenting these cases as arsenical encephalopathy, the criticism may be levelled that they were in reality cases of cerebral malaria. That such may be so cannot be entirely refuted, since we have seen in the past undoubted cases of cerebral malaria with negative blood slides but with positive brain smears.

However, that five should have occurred is more than a coincidence, and we believe these to have been of arsenical origin rather than malarial. It is most unusual, with three-hourly thick blood films and an expert microscopist, to fail to demonstrate parasites in a true cerebral malaria.

The value of the sitting posture in nursing these coma cases is in no way diminished, since this is the method applied by us with success in the treatment of malarial coma and of the coma of heat-stroke, and we hope that others will apply it to arsenical encephalopathy occurring in an area where malaria is not hyperendemic.

Summary

A brief description of arsenical encephalopathy is given and five cases are described.

That these five patients survived is attributed to the procedure of nursing cases in the sitting position.

The method of treatment is described and the physiology of the procedure discussed.

We wish to express our thanks to Col. F. R. Cawthorn, I.A.M.C., who, having early appreciated the value of a "team," kept its members together despite many difficulties; and to Major R. I. Krishnaswami, I.A.M.C., for help and criticism in the preparation of the paper. Our thanks are also due to the nursing officers, Miss D. J. Oliver and Miss J. St. John Inman, whose untiring efforts have contributed in no small measure to the successful treatment of these cases.

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PROLAPSE OF THE RECTUM IN WOMEN*

BY THE LATE

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Apparently it is not generally realized that prolapse of the rectum in women can be treated successfully by an abdominal operation. Nevertheless this is so, and I hope the following account will demonstrate that the method here described should be included in the armamentarium of those surgeons who have to decide the treatment of patients unfortunate enough to suffer from this distressing complaint.

The operation is one that should not be difficult in the hands of those who are accustomed to operate low down in the pelvis, and its guiding principle is self-evident. The desirability of "hooking it up from inside" must have occurred to surgeons, but I acknowledge my indebtedness to Victor Bonney—to whom, incidentally, gynaecological surgeons owe so much—for information as to whether this was or was not a practical proposition. In his book on operative gynaecology he has given a brief account of such an operation, and this can be consulted with advantage by those sufficiently interested.

A war widow aged 29 consulted me on the advice of a colleague of mine because of a prolapse that had occurred shortly after the birth of her first child, which had taken place five years previously. On examination I found that the prolapse was rectal and that some 4½ to 5 inches of bowel protruded. The tone of the anal sphincters was noticeably weak, and pelvic examination showed that the uterus

* The manuscript of this paper was received from the author on the day before he died.

and pelvic floor were relaxed and rather lower than normal. For the relief of this condition she had been operated on by a surgeon who had excised the protruding rectal wall from below in the manner accepted to be adequate, but this had not relieved the condition for long. Knowing the work of this surgeon, who was once a resident of mine, I am sure the operation had been well and truly done and that the failure was in the design of the operation and not in his execution of it. She then consulted a well-known proctologist, and his decision was given against further operation, but electrical treatment was instituted and some pararectal injections were made. Unfortunately no relief followed a persistent course of this treatment, and she was informed that now nothing could be done except a colostomy. This in a young woman of her mentality offered a grim choice from which she naturally shrank.

The patient now became desperate, both mentally and physically, as her whole life centred round the avoidance of calamities in which the bowel contents were suddenly voided. So I decided to operate on her by the abdominal route, having noted that she was a young and attractive woman and would probably wish to marry again. She was realist enough to know that it was the cure of the prolapse that was the target, and if during the course of the operation it should prove to be essential to take steps that would make future pregnancy undesirable that must be regarded as of secondary importance. To me, as the operator, this decision of hers was vital, as I should have to decide during the course of the operation whether to ligature the Fallopian tubes or not. If I were forced to attach the bowel on to the body of the uterus to give it adequate support a subsequent pregnancy might lead to disaster, and must therefore be rendered impossible.

Operation.—With the patient in the Trendelenburg position a lower median incision was made of length adequate to permit free access to the pelvis. The pelvic bowel and rectum were drawn up and a series of No. 2 silk stitches put in place so as to obliterate the pouch of Douglas and suspend the bowel to the floor and the posterior aspect of the vaginal wall. I found the use of Lane's cleft-palate needle-holder a great help in placing these deep and important stitches accurately. Taking care of course not to perforate the bowel, several more tiers were then superadded and the anterior aspect of the bowel supported on to the upper part of the posterior wall of the vagina and the lower third of the cervix, with precautions against leaving a peritoneal pocket into which small intestine could prolapse. Thus far the bowel was nicely and firmly held, and on pulling up the uterus to the position which it would occupy later when suspended, all seemed well, and so I decided against sterilization in this case, as it had not been necessary to attach the bowel to the body of the uterus, which would therefore be unaffected if it were ever subsequently enlarged by a pregnancy. In order to avoid any likelihood of leaving a possible source of obstruction by looping, the pelvic bowel was further spread out and attached to the posterior aspect of the left broad ligament and out on to the pelvic wall, of course avoiding the left Fallopian tube and ureter. On being satisfied on that count, the uterus was firmly suspended by pleating the round ligament on either side from the uterine body out to the pelvic wall. The ends of these silk sutures were then drawn out through the sheath of the rectus on either side and sewn into it firmly. This gave a firm support. (Let me mention here that if it had worked out to be necessary to fasten the bowel on to the back of the uterine body to get adequate support I should have ligatured the Fallopian tubes and fixed the uterus into the abdominal incision by silk sutures.) The abdomen was closed, and on examination at the end of the operation the rectum was found to be very satisfactorily supported. The chief points in the after-treatment were to leave the bowel alone for seven days, and after that an easy and adequate action was produced by liquid paraffin and a small glycerin enema. A residue-free diet was given during these days.

Comment

I have waited for six months before making this report, and the result is so far excellent, and I can see no reason why it should not continue to be so. The bowel now acts readily with daily liquid paraffin, and the patient's evident happiness at the result of the operation is easily understood. Should she marry again later and become pregnant, and should I have to make the decision as to the method of delivery of the child, I should certainly advise Caesarean section and take no risk of any recurrence of her previous very undesirable condition. To this she readily assents, knowing what a recurrence of that condition would entail.

J. K. David and A. S. Minot (*Amer. J. Dis. Child.*, 1944, **64**, 327) record a case of recurrent haemolytic anaemia in a male infant aged 4½ months. Haemolytic activity of the patient's serum took place during an acute haemolytic crisis. After splenectomy the haemolytic activity was no longer demonstrable in the patient's serum and recovery followed.

TUBERCULOSIS OF THE LOWER LOBE

BY

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Pulmonary tuberculosis as it affects the lower lobes has certain characters which deserve special consideration, and it is the object of this paper to call attention to the special features of treatment and prognosis of tuberculous disease in this situation. I have reviewed the clinical records of 2,200 cases of pulmonary tuberculosis in adolescent and adult women who have been treated in the sanatorium at Black Notley in the nine years 1935–43, abstracting those in which the disease was solely or predominantly affecting the lower lobe on one side. Only 81 such cases (3.68%) were found. Cases of tuberculous bronchiectasis—e.g., secondary to childhood bronchial obstruction by enlarged glands and subsequent atelectasis—and cases in which the disease had invaded the lower lobe by bronchogenic spread from one of the upper lobes, were excluded.

The low incidence of lower-lobe disease is striking. The incidence on the two sides did not show any significant difference (48 on the right, 33 on the left side). In 34 (42%) of the cases the apex of the lower lobe was affected, and 32 of these had progressed to cavitation by the time they came under supervision. This tendency to early cavitation of tuberculosis in the apex of the lower lobe is notable, and is worth bearing in mind when considering treatment.

In order to assess the results of treatment the 81 cases of lower-lobe disease have been divided into three groups, based on radiological appearances:—Group I (21 cases): Those showing tuberculous infiltration, including diseases of exudative type, but excluding those in which there was demonstrable cavity formation. Group II (28 cases): Those showing cavity formation, but excluding those in which the cavity occurred at the apex of the lobe. Group III (32 cases): Those in which a cavity had formed at the apex of the lower lobe.

The following is a review of the treatment given. Where pneumothorax is referred to it may be taken to include thoracoscopy, and division of adhesions whenever practicable.

Of the Group I cases, 16 were treated by an initial period of bed-rest alone, which secured quiescence of the disease in 11; an artificial pneumothorax was induced in 4 of the resistant cases and quiescence ultimately secured, though one required a phrenic avulsion in support of the pneumothorax. Of the remaining cases, 3 were successfully treated by early induction of a pneumothorax, 1 by a phrenic avulsion, and 1 by intravenous gold.

Of the Group II cases, 4 were treated by an initial period of bed-rest, which succeeded in 2; one of the remainder was successfully treated by pneumothorax. Of 13 cases treated by early pneumothorax, 10 succeeded, 1 was successful when reinforced by a phrenic avulsion, and 2 were abandoned owing to rapid spread of the disease. Phrenic paralysis alone succeeded in 7 out of 10 cases, the 3 failures subsequently becoming quiescent after treatment by pneumothorax. One case in this group retrogressed in spite of a phrenic avulsion combined with intravenous gold therapy and followed by pneumothorax.

Of the Group III cases, 10 in which the apical cavity was small were treated by bed-rest alone, 8 successfully. Of 16 cases treated by artificial pneumothorax, complete quiescence was secured in 12, 1 had to be reinforced by a phrenic paralysis, and 3 failed entirely. Five cases were treated by early phrenic paralysis—3 succeeded and 2 failed. One other case became quiescent after a course of intravenous gold, but the relative importance of the gold and the concomitant bed-rest was uncertain.

Treatment by Pneumoperitoneum

The use of pneumoperitoneum in the treatment of pulmonary tuberculosis has added another weapon to our armamentarium which most tuberculosis workers agree is of real value in selected cases. One of the indications seems to be disease of the middle and lower lobes, and subsequent to the series of cases reviewed in this paper I have treated a number of cases of mid- and lower-lobe disease by phrenic paralysis followed by pneumoperitoneum. The results so far have been very

successful, particularly with middle-lobe cavities and cavities in the middle or periphery of the lower lobe. For the treatment of cavities in the apex of the lower lobe the efficiency of pneumoperitoneum is not so clear.

Prognosis

The prognosis of tuberculosis of the lower lobe has generally been regarded as poor, but it seems that this is an unjustifiably gloomy view to take. In cases without cavity formation (Group I) the prognosis with suitable treatment appears to be good, as the only unsuccessful case in the present series was that of a patient who discharged herself before treatment was completed. In Group II also, quiescence was ultimately secured in 25 out of 28 cases, and the prognosis is apparently good, though more active measures may be required for treatment than in Group I. Where the cavity affects the apex of the lower lobe, however, the outlook is not so favourable (Group III, 25 cases becoming quiescent out of 32—a "failure-rate" of 21.9%). There was a lower proportion of successful pneumothorax cases in this group. The probable explanation of this is that when the lung is collapsed the apex of the lower lobe moves into the paravertebral gutter and escapes compression.

Discussion and Conclusions

While it cannot be claimed that the figures quoted in this series are statistically significant, they represent the experience of a large sanatorium over a period of nine years, and it is probably justifiable to draw certain conclusions based on clinical observation of these cases. These conclusions are:

1. The incidence of lower-lobe tuberculosis is low (3.68%) in a series of 2,200 cases of pulmonary tuberculosis in adolescent and adult women.

2. There is a distinct tendency to early cavity-formation.

3. The immediate prognosis with adequate treatment is better than has usually been thought.

4. If a cavity has formed by the time the patient comes under treatment it is not wise to rely on too long a period of bed-rest alone, and more active treatment should be given as soon as the patient is clinically fit for it.

5. For cavities not at the apex of the lower lobe a phrenic crush followed by pneumoperitoneum offers a good chance of success, and is probably the best initial treatment. Artificial pneumothorax should be held in reserve for these cases, however, and if the cavity is not showing signs of closure after two months the pneumoperitoneum is unlikely to succeed, and pneumothorax should be attempted.

6. Where the cavity is at the apex of the lower lobe an initial pneumothorax seems to be the best treatment. I have not yet had enough experience of phrenic paralysis followed by pneumoperitoneum in cases of this group to express an opinion whether such treatment will overcome the difficulty of the apex of the lower lobe retreating into the paravertebral gutter when collapse therapy is applied to the lung. It seems unlikely that elevation of the diaphragm, even to the height which can be secured when phrenic paralysis is reinforced by pneumoperitoneum, will have more influence on the apex of the lower lobe than pneumothorax followed by adhesion section. At the same time, if a pneumothorax fails to secure complete closure of the cavity, elevation of the diaphragm may tip the scales in the patient's favour by providing a little extra relaxation to the lung, or possibly, in some cases, by "unkinking" a bronchus which had been partially obstructed and maintaining a retention cavity.

My thanks are due to Dr. W. A. Bullough, County Medical Officer, and Dr. M. C. Wilkinson, medical superintendent, for permission to publish the results.

As a war memorial to children killed by enemy action in London a beautiful and up-to-date children's ward is planned for St. Thomas's Hospital. During the air raids on London there were 12 direct hits on the hospital by high-explosive bombs and 2 by flying bombs, in addition to the fall of a large number of incendiaries. St. Thomas's carried on, caring at the same time for the many people brought in as casualties from incidents in the neighbourhood of the hospital. In September, 1940, two house-surgeons, three nurses, and four masseuses were killed by enemy action. There were no casualties among the patients during the raids.

PREVENTION OF MIGRAINE BY ORAL ADMINISTRATION OF CARBACHOL

AN ANALYSIS OF 12 CASES

BY

ALASTAIR KER JAMES, M.B., Ch.B.

It is now generally accepted that the immediate cause of the symptoms of migraine is spasm and distension of the cerebral arteries, particularly those of the scalp and the dura mater; and Rowbotham (1942) summed up the evidence in favour of this view. Many years ago other observers (Féré, 1883; Flatau, 1912) noted vascular changes during the course of attacks of migraine.

In view of this evidence it seems curious that there appears to be no record of any attempt to treat migraine by the administration of a parasympatheticotonic; but it was clinical observation and not therapeutic theory which encouraged me to follow up the unexpected results in Case 1, in which an attempt to remedy obstinate constipation due to an enormously dilated and elongated colon resulted in a marked improvement in migrainous attacks without much alteration in the bowel action. This was effected by giving one tablet of moryl—a proprietary preparation containing 0.002 g. of carbaminoylcholine chloride (carbachol *B.P.*)—thrice daily, but the patient later received twice that amount. The preparation named has been used throughout this experiment; the word "tablet" signifies a dose of 0.002 g. of carbachol.

Further cases of migraine were similarly treated as they arose, and the results seem to merit publication. Though the series is admittedly small, improvement has been consistent, the method is easy and inexpensive, and no alteration in diet or mode of living has been made. All the cases tabulated suffered from the classical symptoms of migraine—viz., periodic attacks of severe headache, often unilateral, generally preceded by visual disturbance, and always followed by vomiting or severe nausea, after which recovery ensued more or less rapidly.

Case 1 suffers from the colonic abnormality previously noted. Case 4 has pulmonary tuberculosis. No. 2 died of periarteritis nodosa three months after treatment by carbachol was begun. The remainder of the patients are in normal health. Some of the series have been taking carbachol continuously for many months, and no toxic symptoms have been observed apart from an occasional mild sensation of heat in No. 8, who takes six tablets daily.

Tabulated Summary of Results

Case	Age and Sex	Duration of Disease (Years)	Average No. of Attacks per Month			Daily Dosage of Carbachol (g.)	Duration of Carbachol Treatment (Months)
			With No Treatment	With Ordinary Treatment	With Carbachol		
1	56 F	46	—	1·5	0·75	0·012	33
2	56 M (1937)	45	10	8	4	0·006	3
3	33 M	4	4	1·2	0·75 very mild	0·006	28
4	37 F	9	1	—	0·16	0·004	20
5	19 F	5	10	4	0·2	0·008	11
6	14 M	7	12	4	0	0·006	6
7	36 F	22	8	—	0	0·006	9
8	52 M	12	10	4	1·25	0·012	11
9	44 F	30	3	—	0·3	0·004	7
10	29 F	15	3	—	0·4	0·006	7
11	23 F	4	2	—	0·4	0·006	5
12	24 F	5	8	—	1	0·006	2

The results are consistent and better than those of the commonly used remedies, and the beneficial effect is similar to that obtained in epilepsy by phenobarbitone. Sufficient time has not yet elapsed to form any conclusions whether the improvement remains permanent after discontinuing the drug. It seems probable that the oral administration of carbachol produces a less intense but more prolonged effect than injection. Cases in which migraine persists after the age of 50 seem to require larger dosage. It was further noted that the systolic blood pressure in the older age groups was low—average 124—which, together with the fact that in three cases known to me the attacks of migraine gradually ceased with the gradual increase in systolic blood pressure, suggests that only soft and elastic

arteries can be affected by pathological spasm sufficient to produce migraine.

Further investigation into the efficacy of the method described can best be carried out by the general practitioner, who has the opportunity of closely observing his cases. It should thus soon be possible accurately to assess the value of this treatment.

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Medical Memoranda

Gangrene of the Rectum as a Complication of an Enema

From time to time cases are recorded of injuries to the anus and rectum associated with the giving of enemata by means of the Higginson syringe. Such cases are not common, but the case reported below will serve to remind medical men and nurses of the serious consequences, sometimes fatal, which may follow this simple procedure. Gabriel (1937) and Bacon (1938) state that this accident occurs more commonly than is often supposed, and may pass unnoticed if the trauma is not very severe and the resulting pain not marked, and the condition is not reported to the medical attendant.

CASE RECORD

A Polish miner, aged 49, was admitted to the French Hospital under Dr. Andrew Morland, on July 19, 1944, for severe melaena of four days' duration. There was a history of gastric ulcer with recurring attacks of symptoms going back eight years. On one occasion perforation had occurred; on two others haematemesis had been the outstanding symptom. The patient's condition was not very good: pulse 84 a minute but weak; temperature 98° F.; B.P. 100/80. Blood count: red cells, 1,600,000; leucocytes 4,600; Hb (Sahli) 30%. Urine normal. There was nothing else of importance to record.

On the fifth day after admission the patient complained of abdominal pain, and, next day, of soreness in the anal region. Temperature 99–100° F. He was found to have a foul-smelling purulent discharge from the anus, with swelling and redness of the surrounding skin. Proctoscopic examination revealed, however, that the whole of the right side of the rectum from the midline posteriorly to well above the midline anteriorly was a grey and sloughing mass; above and on the borders of the slough the mucosa was red and oedematous. The abdomen was tender in the hypogastric region, and slightly distended but not rigid. Temperature 100° F.; pulse 92.

It was learnt that three days previously a soap-and-water enema had been given, and was repeated the next day. The enema was given by a very efficient Sister by means of the Higginson syringe to which a rectal tube had been adapted, the patient lying on his left side. After the second enema he felt a pain, which did not last long enough for him to mention it.

It was considered that the patient's condition was serious, so Mr. H. W. S. Wright was asked to see him. He made an examination together with Mr. E. T. C. Milligan. In the meantime the temperature rose to 101° F.; the pulse was 92, and the patient complained of pain. A second proctoscopic examination was done. Diagnosis of gangrene of the rectum was made. A biopsy from the part above the slough was taken, which subsequently showed on section a polypoid mucosa without malignancy.

It was decided to treat the patient conservatively by giving him sulphathiazole and gas-gangrene antitoxin. Sulphathiazole 2 g. was given immediately, being followed by 1 g. every four hours for four days, then 1 g. every six hours for another six days. Antitoxin, 60 c.cm., was injected intramuscularly the first day, then 20 c.cm. for six days. Under this treatment the patient improved rapidly. Temperature and pulse were normal on the fifth day; the pain had disappeared; a slough was passed, leaving a clean ulcerated area which was healing satisfactorily; there was scarcely any discharge, and on August 15 only a small ulcer was present at the ano-rectal junction. At the patient's departure from the hospital on Sept. 6 this ulcer was completely healed, leaving no stricture.

COMMENT

The case just described is similar in many features to those of Rayner (1932), Pinnock (1937), Murray (1937), and Gabriel (1937). The only difference noted was, whereas in the previous cases the lesion was due to the hard nozzle of the syringe, in the present case it was the rectal tube, generally advised to be used, which produced the lesion. On the other hand, the rectal mucosa presented on section a polypoid appearance—a condition easily damaged even by slight trauma. The mechanism of infection is thought to be as follows: soap-and-water, which may contain caustic soda or potash, is injected under a certain pressure into the submucous layers of the anal canal and rectum, stripping off the mucosa and so depriving it of its blood supply. Micro-organisms usually present in this region find, therefore, a medium favourable to their development and spread.

The prognosis of such cases is always very serious, and death is a frequent end-result even after extensive surgical intervention. Pinnock had two cases with one death, Murray three cases with two deaths, and Gabriel three cases with two deaths. The treatment usually adopted consists of laparotomy with either colostomy or caecostomy. The results are not always satisfactory, the patient being sometimes left with a permanent colostomy or stricture of the rectum. The rapid improvement noticed in the case described was thought to have been due to the combined action of sulphathiazole and antitoxin. The sulphonamides provide us with powerful weapons to fight the high mortality of this serious accident.

I am indebted to Dr. H. S. Stannus for his advice, and to Mr. Wright and Mr. Milligan for their proctoscopic findings.

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A Case of Broncho-oesophageal Fistula with No Pulmonary Symptom

Broncho- or tracheo-oesophageal fistula is a well-known complication of erosive conditions of the oesophagus and is often found as an end-result of malignant adhesive peri-oesophagitis. The development of a direct opening between the oesophagus and the upper part of the bronchial tree might well be expected to bring about obvious signs of respiratory distress on the swallowing of fluids, but that this does not necessarily happen is apparent from the following clinical note.

CASE REPORT

A man aged 60 was referred to hospital on Nov. 27, 1944, with all the obvious features of a fairly well advanced cancer of the upper third of the oesophagus. Examination revealed the usual emaciated patient who was able to locate the site of obstruction quite accurately with one finger at the level of the angle of the sternum. At the time of the first examination he asked for a drink of water, which he swallowed slowly, with difficulty, but without coughing. Inspection, percussion, and auscultation of the lungs did not reveal anything abnormal. An attempted barium swallow, carried out at once, caused choking and had to be discontinued because the fluid was seen to run from the oesophagus into both main bronchi, spreading out in their pulmonary ramifications not unlike an ordinary lipiodol screening. Direct inspection by an oesophagoscope showed a mass extending round and closing the lumen of the upper third. On looking into the trachea a small ulcer was seen at the beginning of the left main bronchus, suggesting a broncho-oesophageal communication.

Gastrostomy was obviously the only possible line of treatment, and, with this in view, the patient was put on an intravenous glucose-saline drip for three days. The operation was then successfully carried out under local analgesia. Following upon this the patient subsisted for 10 days by gastric-tube feeding, but died suddenly at the end of that time.

At necropsy the tumour of the oesophagus, a moderately differentiated squamous epithelioma, was found to be adherent to the vertebral column and the arch of the aorta, and had a well-marked fistulous opening extending from it through to the left main bronchus. The lumen of the oesophagus up above the fistula was narrowed to a great extent, but could nevertheless quite easily have permitted of the running down of fluids. The lower lobes of both lungs were of a solid firm consistency and had a sticky fibrinous exudate over their posterior surfaces, their appearances being those of a confluent bronchopneumonia.

COMMENT

There was thus no doubt about the existence of a broncho-oesophageal fistula, but how long this had been present before the patient's investigation in hospital is a matter of conjecture. In view of the size of the fistulous opening, however, it seemed quite reasonable to assume that it had been there for some time, possibly weeks.

The outstanding feature of the case was the fact that the swallowing of fluids which obviously passed down directly into the patient's lungs did not set up any acute reaction. There was no coughing on swallowing, nor was there any regurgitation of copious frothy sputum.

From the clinical point of view an accurate diagnosis could not have been made in this case without ancillary aids of investigation, in view of the complete absence of pulmonary symptoms.

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R. T. CAMPBELL, M.B.

Royal Infirmary, Edinburgh.

Reviews

A TREATISE ON CATARACT

Cataract and Anomalies of the Lens. Growth, Structure, Composition, Metabolism, Disorders, and Treatment of Crystalline Lens. By John G. Bellows, M.D., Ph.D., (Pp. 624; illustrated. 60s.) London: Henry Kimpton. 1944.

Cataract is one of the major problems of ophthalmology. Though surgery gives gratifying results, it can do little for many patients who suffer from severe decline in vision without reaching the stage where operation is either justifiable or feasible. The problem of cataract is thus not exclusively, and perhaps not largely, a problem in surgery. This fundamental truth is brilliantly illustrated by Dr. J. G. Bellows's balanced and monumental *Cataract and Anomalies of the Lens*, a book in the great tradition. A fascinating historical introduction is followed by four chapters occupying almost a third of the book, and dealing with the development, comparative anatomy, growth, structure, chemical composition, and metabolism of the lens. An immense and scattered literature (there are about a thousand references for this section alone) is here surveyed with admirably critical insight. The rest of the text deals with the clinical aspects, and the even more voluminous clinical literature is systematized with the same mastery of the subject and sureness of touch. The different clinical types of cataract are clearly correlated with the embryological, genetic, experimental, and biochemical knowledge that has accumulated, and it is gratifying to find that something like a coherent picture is beginning to emerge out of what at one time constituted a mass of anatomical names. This systematization and clarification, perhaps more than its encyclopaedic range, is the most characteristic feature of this book.

In a foreword the late Prof. S. Gifford compares the book to the earlier study by Hess. This is high praise, but inadequate in this instance. It would be truer to say that Bellows's study has not merely replaced but has surpassed Hess's monumental treatise.

HYPERTENSION AND HYPERTENSIVE DISEASE

Hypertension and Hypertensive Disease. By William Goldring, M.D., and Herbert Chasis, M.D. (Pp. 253; illustrated. $3.50 or 20s.) New York: The Commonwealth Fund; London: Oxford University Press.

This is a book well worth study. Drs. Goldring and Chasis have approached the subject from the point of view of deranged human physiology; that is their attitude to hypertension, and they trace from this at first reversible state the development of the irreversible changes of hypertensive disease. As the authors point out, they have gone back to preclinical studies to do this, and so have aimed at linking more closely physiology and clinical medicine. It is an excellent example and one which might be more often followed.

The book starts with a survey of the types of hypertension and a discussion of the range and value of blood-pressure readings. Then follows a description of the clinical features of hypertensive disease. This chapter is short and bare, making rather dull reading. The authors doubt the existence of a recognizable pre-hypertensive state, and the value of the cold pressor test. Next comes a description of the haemodynamics of hypertension, very clearly set out. They have used catheterization of the right heart for estimation of the output. They agree with the conclusion that vasoconstriction causes the increase in peripheral resistance responsible for the raised blood pressure. A long and very interesting chapter follows on the role of renal function. They have particularly studied the rate of glomerular filtration and the effective renal blood flow, and the excretory capacity and the reabsorptive capacity of the tubules. They conclude that vasoconstriction of the efferent arteriole of the glomerulus, of non-neurogenic origin, is the first abnormal functional change in the kidney. This brings about increase in glomerular filtration but decrease in tubular excretion. The authors doubt the role of unilateral renal disease as a cause of hypertension. Treatment of the disease is discussed with common sense and scepticism, the cause being as yet unknown. They concede that sympathectomy, if extensive enough, may relieve symptoms sometimes, but it does not get rid of the unknown cause. Finally there are appendices giving full data of all their experimental methods.

This book needs careful study and can be thoroughly recommended. The matter is stiff, and the expression is not always as clear as one might wish. The criticism of other work is full and fair. The authors' own opinions are backed up with good reasons. In view of the great volume of work on the subject, largely based on animal experiment, which has appeared in the last decade, this human study is particularly interesting and provides a valuable approach from a different point of view.

DECLINE IN FERTILITY

Race Suicide? By G. F. McCleary, M.D. (Pp. 126. 6s.) London: George Allen and Unwin.

Dr. McCleary's previous contributions to the literature of demography have been characterized by lucidity and fairness; in this book he maintains the high standard he has set himself, with one possible exception to which we shall refer.

In the first chapter he presents the ideals of happiness for its own sake and of duty to which happiness is a corollary, using two well-chosen quotations from Pater and J. S. Mill as texts. In the second chapter he lucidly describes the decline in fertility and how it is measured. In the next chapters the method (birth control) and some of the social reasons are explained. The sixth chapter describes the decline of fertility in the United States of America. In the seventh chapter, which is largely devoted to a criticism of the, sometimes exaggerated, claims of eugenists, Dr. McCleary, we think, falls a little below his own standard of fairness. For instance, speaking of intelligence tests, he writes: "A child of exceptionally intelligent parents achieves a high score in the tests. It would be without warrant to assume that he was born with exceptional gifts; his success may have been due to a life-long association with persons of exceptional intelligence." We should comment that it would be without warrant to assume that this possibility had not occurred to scientific eugenists. There is, we believe, a considerable literature dealing with the differentiation of environmental and inborn factors, and even some on the study of identical twins brought up under different environments.

Chapter 8 studies attempts to increase fertility by legislation, and the last chapter speaks of the future. Whether the appointment of a Royal Commission and a system of allowances for children will have more effect than the legislation of Augustus remains to be seen. Dr. McCleary makes an important point when he shows that in Sweden, a country which has not been at war for more than a hundred years, and has suffered less from others' wars than most neutrals, the decline of fertility has been almost maximal. So a distaste for providing cannon fodder has not been of primary importance as a motive of voluntary sterility. Dr. McCleary says we must have faith in the future of the human spirit. Perhaps the younger generation will.

HEALTH PROBLEMS IN CHINA

China's Health Problems. By Szeming Sze, General Secretary, Chinese Medical Association; editor, *Chinese Medical Journal*. Third edition. (Pp. 76. $1.00.) Washington: Chinese Medical Association, P.O. Box 6096.

The interest aroused in the publication of *China's Health Problems* has encouraged Dr. Szeming Sze to bring out a third (1944) edition. For this the text has been largely rewritten and now includes new sections on the antituberculosis, antivenereal, and antileprosy movements, also on birth control and on nutrition. In view of her unpreparedness for Japanese aggression and her internal political troubles, China's defiance of defeat is truly amazing. War has, however, had the outstanding benefit of emphasizing the magnitude of her health problems and the need for remedial action. China has morbidity and mortality rates which are more than double those of any European country. Of the population 84% live in rural areas and are too poor to pay for private medical care, so that the only solution of this difficulty lies in State medicine, but this in turn must await the provision of an adequate medical profession. If the generally accepted standard of one doctor for 1,500 people is followed China should have some 266,000 doctors. Actually there are only 12,000. Dr. Sze devotes Part II of his book to the status and organization of the National

Health Administration, which controls a number of subsidiary departments—public health, experimental medicine, nursing, maternal and child welfare, and others. Increasingly difficult economic conditions limit much of this work to paper schemes, and we must await the arrival of peace before they can be developed to any practical extent.

One of the Chinese Government's chief responsibilities will lie in the establishment of a higher standard of medical education. At present the number of poorly qualified doctors passing through medical schools of low degree is greater than those from the larger colleges. It is most unfortunate that the Peking Union Medical College, which set the standard for all China and on which the Rockefeller Foundation spent well over £10,000,000, should have been seized and closed by the Japanese. The most active medical body in China is the Chinese Medical Association, which represents the cream of the profession. It has branches in all the main cities and publishes a journal.

This informative report collates the chief problems and puts them in their proper perspective. It is the first of a series of publications relating to the national reconstruction of China.

Notes on Books

A Synopsis of Medicine, by Sir HENRY TIDY, first appeared nearly 25 years ago and soon gained wide popularity. By 1941 it had passed through seven editions and four reprintings, and several thousand copies of another reprint were destroyed by enemy action. Now comes an eighth edition (John Wright and Sons; 30s.). Numerous changes have been made, and the inclusion of new articles and the rewriting of others account for an addition of 40 pages to the text. The greatest advance since the publication of the seventh edition at the beginning of 1939 has been in the region of treatment. "Sulphonamides, then just rising above the horizon, have proved their power over many diseases and saved countless thousands of lives. Some other great advances in therapeutics of recent years have become almost stabilized." The author refers also in his preface to penicillin, "the astonishing substance which will fill many of the gaps still left vacant in the treatment of infections. . . . Knowledge of its action is still advancing rapidly, and it has been considered wiser to omit such incomplete and ephemeral references as would alone have been possible at the time of revision."

No. 22 of the *Proceedings of the University of Otago Medical School*, for the year 1945, is edited by Prof. J. B. DAWSON. It comprises twelve reprints of articles on miscellaneous subjects, most of which appeared originally in the *New Zealand Medical Journal*.

T. J. SMITH and NEPHEW Ltd., of Neptune Street, Hull, have produced a new edition of their illustrated publication *Cellona Technique*, a handbook for the functional treatment of fractures, with sections on plaster treatment of tuberculous conditions, soft-tissue injuries, burns, etc. Owing to wartime conditions the number of copies is limited, but the manufacturers will send a copy to any doctor who does not already possess one or whose edition is out of date.

Preparations and Appliances

A SMALL PORTABLE ELECTRO-CONVULSIVE THERAPY APPARATUS

Dr. A. SPENCER PATERSON writes:

The basic requirements of an apparatus for electro-convulsive therapy are not elaborate, and it is because of the additional requirement of maximum possible safety that the machines generally used have been of a somewhat cumbersome nature. Essentially, the function which the apparatus has to perform is to switch on and off a voltage of the order of 100 v. to the electrodes on the patient, with a time interval of 1/2 to 1 second. Alternating current of the ordinary mains frequency serves in an entirely satisfactory manner, and the problem of supply of suitable current is therefore most conveniently met from this source.

To provide the necessary time control, various devices have been used. The chief of these have been motor-driven time switches and condenser or valve circuits operating relays. All such arrangements can, with sufficient care, be made reliable, and they have met the needs adequately. They are, however, either heavy or unduly complex for the simple purpose of switching the current to the patient, and a simplification has been introduced in the present apparatus in the use of an automatic telephone dial for the timing mechanism. This, with suitable modification of its contacts, can be made to switch the current on and off with a time interval exactly equal to the number "dialled" in tenths of a second, and therefore forms a very convenient and simply operated device for the purpose in question.

Selection of the required voltage for the treatment is made by a number of tappings on the secondary of a transformer, connected to the poles of a rotary switch: these tappings are spaced by 10 volts and cover the range 70 to 150 volts, so that any appropriate figure can be chosen to the accuracy that is required in such treatment. This arrangement economizes

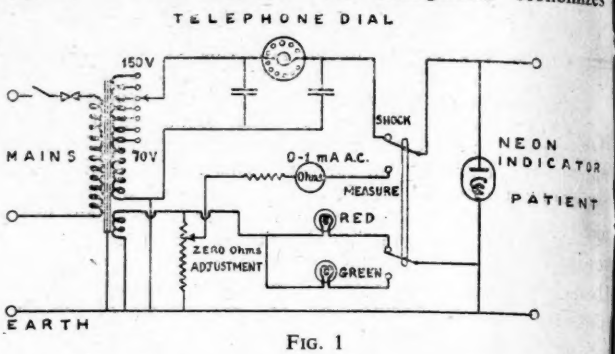

FIG. 1

FIG. 2

greatly in weight and bulk compared with the method of voltage control by a high-power resistance in the primary circuit, commonly used.

Measurement of the patient's resistance before giving the convulsion is carried out by connecting a low voltage, of the order of 1 volt, to the electrodes, and observing the current passing through an a.c. milliammeter in the circuit. This meter is calibrated directly in ohms to simplify reading: it must be remembered, however, that the value obtained refers only to the low voltage at which the measurement is made, and the resistance falls very considerably as the voltage is increased. A change-over switch sets the instrument in the "test" or "shock" condition, and indicator lights are fitted to show at a glance which condition is in operation. In addition, a neon lamp is incorporated which glows only for the time the high voltage is switched on: this allows one to test the apparatus by turning the dial before the connexion to the patient is made, and serves as a check that the circuit is "alive."

The circuit diagram is shown in Fig. 1, and a photograph of the finished instrument in Fig. 2. It is made in the most convenient form for carrying, being of minimal size and weight. It is $12 \times 5\frac{1}{2} \times 4$ in., the size of a small attaché case, and weighs, including two flexes, 11 lb. It is finished in an inconspicuous manner to this same end. The usual protection by means of fuses as well as an earthed lead in the mains cable are included to give maximum safety to the operator and the patient.

It has been used on a number of patients in various hospitals, and meets the needs of a light portable E.C.T. unit satisfactorily.

I am very much indebted to Dr. Frank T. Farmer, late of the Middlesex Hospital and now physicist to the Royal Victoria Infirmary, Newcastle-upon-Tyne, for his valuable help in the designing of this instrument. It may be obtained from Mr. B. Malme, 423, Hertford Road, Enfield, Middlesex, whose ingenuity has also been of great service.

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VICTORY IN THE WEST

It was officially announced on Tuesday, May 8, that the war in Europe is over. The prodigious events of the last few weeks, culminating in the fall of great armies and cities, foreshadowed the total surrender of Germany. Expectation had been keyed up long in advance of the armistice. Thankfulness and relief are the uppermost feeling in all minds; but, while it is right to rejoice at the great deliverance in the West, no thoughtful person forgets that victory is not yet in the East, and that British and American ships and planes and men are in peril until Japan capitulates. We remember too the plight of the stricken people of Europe now freed from the Nazi yoke, but still to be brought back to a semblance of normal life. The effect of starvation and under-nourishment and the danger of epidemic conflagration in a disrupted Central Europe are matters which are foremost in the thoughts of doctors. In the peace that will develop, medicine, having played so large a part in war, will, we believe, play an even greater part in solving the problems of the future.

PHARMACOPOEIAS AND THE PHYSICIAN

Dr. F. H. K. Green has given a good account[1] of the Therapeutic Trials Committee of the Medical Research Council, which organizes clinical trials on behalf of manufacturers of drugs, provided certain conditions are satisfied in regard to disclosure of composition and publication of results. Since the scheme was started in 1931 more than 40 new products have been accepted for clinical trial. The Council on Pharmacy and Chemistry of the American Medical Association[2] does not initiate investigations, but it reviews evidence submitted to it by manufacturers. Here again there is a set of rules on composition, nomenclature, advertisement, and therapeutic claims, and articles which are accepted are awarded the council's seal of approval. It is estimated that the A.M.A. council considers from 250 to 400 articles every year. Its book *New and Non-official Remedies* describes 1,300 agents, and the *Journal of the American Medical Association* publishes accounts of individual decisions as well as the council's reviews of new developments in therapeutics. The two bodies are therefore engaged in rather different types of activity—the British committee in clinical research, and the American in the provision of information and ethical nomenclature. The Socialist Medical Association[3] has suggested the creation of a Therapeutic Substances Committee which would combine both these and other types of activity. It not only would control all therapeutic substances and appliances and advertisements of them, but would examine and report publicly on all substances offered or advertised for the treatment of disease or the protection of health. It would also have the duty to prepare and submit to every doctor reports on new remedies, and to recommend their inclusion in or exclusion from the *National Formulary*. A glance at the booklet *War-Time Information for Pharmacists*,[4] and in particular the long list of associations connected with the provision of therapeutic substances, suggests that these tasks would be far beyond the powers of any single committee.

We may doubt whether the present drive to rationalize all our social mechanisms is entirely healthy. Nevertheless, it does appear that arrangements for the codification of therapeutic substances in this country are unduly complicated. The *British Pharmacopoeia*, which is prepared by the Pharmacopoeia Commission appointed by the General Medical Council, is designed to provide standards for those drugs which are in general use throughout the Empire. As these are legal standards, the Commission must err on the side of caution in admitting articles to the *Pharmacopoeia*. During the war, however, the Pharmacopoeia Commission has appointed a committee to choose approved names for new remedies which are under trial and which seem likely to be admitted to the *B.P.* in the future. The *British Pharmaceutical Codex* is prepared by the Codex Committee of the Pharmaceutical Society. It is designed as a book of reference for pharmacists and medical practitioners, and gives standards for many articles not included in the *B.P.*, either because they have fallen out of general use or because they are of recent introduction and have not yet had general acceptance. The *Extra Pharmacopoeia* (Martindale), which is now published by direction of the Council of the Pharmaceutical Society, is particularly concerned with recent developments in pharmacology and therapeutics, and it has made itself an indispensable source of information about new, foreign, and proprietary drugs. Unfortunately in the process it has tended to outgrow its original make-up in two pocket volumes, and a fairly drastic revision of its form and contents will soon become unavoidable. The *Extra Pharmacopoeia* aims at being absolutely comprehensive and inclusive, and therefore differs in purpose from both the *British Pharmacopoeia* and *New and Non-official Remedies*, which aim at being exclusive.

This brief review suggests that the time has come when there should be some more formal definition and integration of the functions of the *B.P.*, the *Codex*, and the *Extra Pharmacopoeia*. An official veterinary pharmacopoeia might also be created. The most vital question is the control of the introduction and nomenclature of new drugs. Many people do not like the word "control," but a seal of acceptance is useless unless backed by control of advertisement as well as by general good will. Direct Government control of advertisements of drugs, as suggested by the Socialist Medical Association, would be violently opposed on political and economic grounds, and it would be difficult to enforce. It is not always easy to say whether a substance is a drug, a food, or a cosmetic. In fact, the same substance may be used for all three purposes. Control by the Pharmacopoeia Commission would be more

[1] *Brit. med. Bull.*, 1944, **2**, 58.
[2] Smith, A. E., *J. Amer. med. Ass.*, 1944, **124**, 433.
[3] *Medicine Today and Tomorrow*, 1943, **4**, 9.
[4] Compiled by the Pharmaceutical Journal, London, 1942.

gracefully accepted, particularly if it took the form of an extension of the policy of approved names. Such approved names could almost certainly be regarded as "the accepted scientific name" for the purposes of the Pharmacy and Medicines Act, 1941, which means that the approved name ought by law to be printed on the label of any container in which the drug is retailed. In addition, the editors of reputable medical journals would probably be willing to include the rule of using approved names in their notice to contributors and advertisers. This policy of approving names will undoubtedly increase the work of the Pharmacopoeia Commission, and it is perhaps appropriate here to record the debt of the profession to it and the Pharmaceutical Society, and to the many men who have served on their committees and subcommittees with so little reward or recognition.

Clinical trial of remedies is a tremendous task. The evaluation of a single remedy for hypertension or for cancer may take years and must consume a corresponding amount of the time of valuable investigators. The arrangements suggested by the Socialist Medical Association might well result in political pressure on the research worker, and politicians are not necessarily good judges of therapeutics, as some of them have shown in recent years by misguided enthusiasm for alleged remedies for incurable conditions. The complaint against the Therapeutic Trials Committee is that it moves too slowly, and certainly during the war the tendency has been to short-circuit it and use *ad hoc* organizations, as in the trials of penicillin and patulin. In any event a manufacturer would wish to have a strong case before approaching a body like the Therapeutic Trials Committee, and to begin with he may prefer to make contact with an individual investigator or group of investigators who are interested in the particular field and capable of making tests. Clinical trials may be better carried out in local authority hospitals than in teaching hospitals or key hospitals. The researches on the treatment of meningitis in L.C.C. hospitals[5] and on pneumonia in Glasgow[6] are models of their kind. The Local Health Services Councils may one day provide a mechanism for the promotion of large-scale trials where these are necessary. The days when testimonial evidence could be offered are over, and conclusions on therapeutics must be statistically sound. Trials of this kind will often be enough to show whether a new remedy is acceptable, and it may only be necessary to invoke the more elaborate mechanism of the Therapeutic Trials Committee in special cases. Reputable manufacturers are just as anxious to know the truth as clinical investigators, for they do not wish to embark on heavy expenditure in manufacturing a drug which is not efficacious. There is no reason why manufacturers should not bear the cost of clinical investigations, provided the financial arrangements are approved by the university or hospital authority whose laboratories or wards are being used. But in the final court of appeal—the Medical Research Council Therapeutic Trials Committee—the rule must continue to be enforced that there must be no financial arrangement or contact of any kind between manufacturer and clinical scientist, to avoid the slightest suspicion of bias.

[5] Banks, H. S., *Lancet*, 1938, **2**, 7.
[6] Anderson, T., *et al.*, ibid., 1939, **2**, 776.

THE REPRESENTATIVE MEETING

Although the contents of the document circulated by the Association to its members have leaked out on to the pages of the lay press, we are still under an obligation to the Minister of Health not to disclose publicly the administrative proposals which were discussed at last week's Representative Meeting. It should be made clear that the secrecy shrouding these discussions is regretted by the Association, which has to adopt the expensive measure of circulating a confidential report of the meeting to every member of the profession. This will be sent out in the near future. From the point of view of the Minister it would apparently be improper for him to allow publication of new proposals until they have been put before the House of Commons. It is necessary to appreciate this point of view of procedure and to respect the Minister's wishes. What we do deplore is the hectoring attitude of some of the self-appointed critics of the medical profession, a few of them, indeed, being inside the ranks of the profession. Their curious view of the method of negotiation seems to be that those who represent the profession should accept the Government's first words without demur. This lop-sided view of democracy is one which hitherto has been more popular on the Continent than in this country. Fortunately the Minister of Health has stuck to the Government's view that the White Paper was published as a basis for discussion with the various interests concerned, and that legislation would not be introduced until full discussions had been held. That there has been give-and-take in the discussions between the Negotiating Committee and the Ministry is wholesome evidence that democracy still works. The voices that have shrieked "No concessions to the doctors" are unfortunate evidence that democracy is not so secure as many of us would wish to think.

There is no doubt that at the meeting last week the Representatives appreciated the hard work the Negotiating Committee had put in, and, by their voting on some outstanding issues, believed the results of the negotiations to be such as to provide a sufficient framework for the proposed National Health Service. It would, however, be erroneous to pretend that the meeting felt happy about the position with which the profession is faced—a discomfort that was reflected in the recurrent appeal, "We must be realists." On one issue that has perplexed many—the 100% issue—the meeting hardly needed to be reminded that 60% of those who answered the Questionary were in favour of including the whole population in a comprehensive health service. The many debates on this subject during the past three years have made it more and more evident that it is illogical to try to exclude one-tenth of the population of this country from a National Service. It would certainly be very difficult to persuade the lay public that exclusion of 10% was in some way bound up with professional freedom. But the fact that many medical men have fought against the 100% issue is in itself a sign of the general distrust a strongly individualistic profession has for administration by central and local government. Those who finally build the new service will have to take this distrust into full account, and will be successful in removing it only in so far as they ensure that the medical profession has

predominant voice in the running of a highly technical service, the contents of which are a closed book to the majority of laymen. The layman is, indeed, probably more ignorant of medical science than of any other science, pure or applied.

If, in the future political development of this country, central control and direction increase to the point at which the individual controlled begins to lose a sense of full responsibility for what he does, then the quality of service will deteriorate, and the servant will devote much of his energies to making quite sure he does not do one iota more than what he considers he is paid for. Doctors as a body are in a weak position in comparison with other sections of the community, for the humanitarian nature of their work forbids their resorting to the political device of the strike. We can only hope that the country will not abuse this position by exploiting the fact that no medical man would ever refuse to go to the assistance of a sick person. The new service must be so evolved as to give the doctor the fullest scope for practising his art, which is still largely an individual art applied to individual men and women.

PRESIDENCY OF THE B.M.A.

During the past two years two Presidents of the British Medical Association have died while in office—Sir Beckwith Whitehouse and Viscount Dawson of Penn. The Council at its last meeting on May 2 was faced with the position that there was no Immediate Past President to fill the vacancy caused by Lord Dawson's death, and under the by-laws it fell to the Council to provide for the discharge of the duties of the office until the next Annual Representative Meeting. The Council decided to appoint Mr. H. S. Souttar as President until the next A.R.M. in July, and to recommend to the Representative Body the election of Mr. Souttar as President in respect of 1945–6. It is a great advantage to the Association to have now as its titular head a man who has served it in a succession of high posts, culminating in the Chairmanship of Council during the first four years of this war; he has also been Chairman of the Central Medical War Committee and of the Medical Planning Commission, and was Chairman of the Representative Body in 1934–7. Mr. Souttar is in active practice as a surgeon to the London Hospital, and recently held office as Vice-President of the Royal College of Surgeons of England. Apart from his eminence in the profession and his many public services our new President is known to a large proportion of the members at home and abroad for the kindness and grace of manner which are part of his nature.

ARCHIVES OF DISEASE IN CHILDHOOD

With its 101st number the *Archives* enters upon a new phase, for it now incorporates the *British Journal of Children's Diseases*. It is therefore a suitable moment to record the brief history of these two journals and to take a glimpse at the future. The *British Journal of Children's Diseases* made its first appearance in 1904 under the editorship of the late Dr. George Carpenter, who, in an editorial note, observed that in the British Isles there was then no periodical which dealt with disease in childhood, although America, France, Germany, and Italy were making headway in this special field of medical journalism. In 1900 the Society for the Study of Disease in Children had been founded, and undoubtedly its growing strength hastened the birth of a special journal. Carpenter was much helped in his enterprise by the late Mr. R. E. Adlard, of the printing firm of Adlard and Son, Ltd. Dr. Carpenter had saved the life of one of the children of Mr. Adlard, who showed his thankfulness by launching and financing the *British Journal of Children's Diseases*, now no longer published as a separate periodical.

The *Archives of Disease in Childhood* first appeared in 1926, largely through the energies of the late Dr. Hugh Thursfield and the late Sir Dawson Williams, then Editor of the *British Medical Journal*, who retained a life-long interest in diseases of children. The new journal was welcomed in our columns in these terms: "Nearly a year ago some of the medical men whose work lies chiefly among children, and who for a considerable time had felt that English work in this branch of medicine was inadequately presented by existing publications, met together, and after discussion determined to sound their colleagues on the advisability of establishing a new journal." The high literary and scientific standard set by the *Archives* has been worthily maintained by its Editors, and the current issue, the first run of the second hundred, sees it strengthened by its absorption of another journal and by the formal recognition of the strong link that exists between the *Archives* and the British Paediatric Association. The appointing of editors and editorial committee and board is now a joint function of the B.M.A. and the B.P.A. The British Paediatric Association has, in recent times, shown its active concern with the preventive aspects of child health, and no doubt this will be reflected in the editorial policy of the *Archives*, which should therefore have a wider appeal in the future, especially to those practitioners whose work among children is associated with that of local health and education authorities.

Much of the preventive medicine of childhood must rest upon the scientific study of disease. The recognition of the disease rickets, for example, and the discovery of its cause have made it possible to plan preventive measures in a scientific way; and so with scurvy. Protective inoculation against such infections as diphtheria, the diagnosis of foot faults and faults of posture, the study of the abnormal behaviour of the "problem child"—all these are witness to the fact that the approach to health has often to be made by a study of the abnormal. The standards of the normal, of "positive health," are but little known, so the title of the *Archives*, if it does not reflect the new optimism, at least reflects what is and not what might be.

THE ASSOCIATION OF SURGEONS

Early in 1914, in a letter to Sir Rickman Godlee, Sir Berkeley Moynihan suggested the setting up of an Association of Surgeons of Great Britain and Ireland. The war of 1914–18 postponed a decision on this, and it was not until January, 1920, that the Association was in fact founded, Sir John Bland-Sutton being elected its first president. The number of Fellows was limited to 250, and the objects of the Association were declared to be the advancement of the science and art of surgery and the promotion of intercourse and friendship among the surgeons of the United Kingdom. The new association took over the *British Journal of Surgery*, which had up till then been managed by a committee of surgeons, but any Fellow reading a paper at a meeting of the Association was to be at liberty to publish it where he wished. Last week the Association met under its new president, Surgeon Rear-Admiral Gordon-Taylor, and completed a day's programme by assembling at a dinner to which many distinguished guests had been invited. There were only two speeches. Sir Alfred Webb-Johnson, in proposing a toast to the President, paid a graceful tribute to him as a surgeon-

anatomist and a man of wide culture. In reply, Admiral Gordon-Taylor gave the audience an example of his mastery of oratory, when, by the device of fantasy, he conjured up some of the recent great figures in the history of surgery. In these rather bleak days the large number who attended the dinner were evidently delighted at the opportunity of once more promoting the fellowship of the Association of Surgeons of Great Britain and Ireland.

HEART INJURY

Damage to the heart is so often fatal that the account by Hugh Barber[1] of cases in which the patient has survived is of much interest. They had suffered non-penetrating injuries. The sort of accident which leads to these are blows on the thorax, in particular from the steering-wheel in motoring collisions, crushes, and occasionally falls. External injury may be slight; the thoracic cage is very elastic and the heart may be damaged although no bones are broken. Rupture of the heart may cause death at once, but contusion of the myocardium is compatible with life and not uncommon if it is looked for. The damaged area may rupture later. Routine examination of the heart by the electrocardiograph may give useful evidence. Abnormal curves may be found in about a quarter of the cases, and Barber shows the value of taking records as soon as possible after the accident; as many changes are transient, repeated tracings must be taken. Changes in the T waves are the most frequent findings. Pericardial friction is a useful diagnostic sign, but it does not last long. The early diagnosis of haemopericardium is important for the patient, because tamponade may develop if the effusion of blood is at all large. This is an urgent indication for relief by aspiration; the signs are rising venous pressure and pulse, and falling blood pressure and pulse pressure. Physical signs of myocardial contusion are not conspicuous —possibly nothing more definite than weakness of the sounds. After a latent period signs of failure may come on, with frothy expectoration, dyspnoea, falling blood pressure, and rising pulse rate.

Most cases of myocardial contusion probably clear up completely. Sometimes angina of effort may persist, and sometimes a sort of effort syndrome. Occasionally an aneurysm of the ventricle may be found later. Diagnosis becomes more complicated when there has been antecedent myocardial disease. There appears to be good evidence that coronary thrombosis may be precipitated by trauma when the arteries are already diseased. There is no doubt that auricular fibrillation may arise from injury, as may paroxysmal tachycardia; also sinus bradycardia and occasionally heart-block. Rupture of the aortic and mitral valves has been known for years as a result of severe physical effort: direct violence may rupture them. These findings have a good deal of medico-legal importance in assessing damages when disability results. Fortunately it appears that contusion of the myocardium is unlikely to have a permanent effect on a healthy heart. It is evident that special care should be paid to the examination of the heart after precordial injury, and an electrocardiogram should be taken as soon as possible. The differentiation of antecedent disease and the effects of trauma may give rise to knotty problems in a court of law.

THE MENTAL HOSPITAL

In March, 1943, there was an outbreak of amoebic dysentery at one of the New York State mental hospitals, and the scandal which resulted led Governor Dewey to appoint a Commission to inquire into the administration of these hospitals. General physicians and hospital administrators were represented on the Commission, but psychiatrists only among its advisers. The report of the Commission[1] has therefore a somewhat fresh point of view.

The Commission was unpleasantly surprised to discover the extent to which the State mental hospitals had been allowed to become custodial institutions rather than hospitals in the true sense of the word. The hospitals were understaffed. The State Department had set itself a goal of one physician to 150 patients, but this had never been achieved. Too much of the time of the available physicians was taken up with the care and treatment of the physical ills of the patients. This could be better handled by a staff of "internes," assisted by visiting physicians. Arrangements for active treatment were chaotic. In some hospitals they were available, in others not. A patient's chance of recovery depended on the accident of which hospital he came to. Dementia praecox accounted for a quarter of all admissions and led to an average stay in hospital of 19.3 years. In a second report[2] the Commission has recommended that insulin treatment should be made available to all such patients in the State hospitals. Insufficient interest was also shown in putting the maximum number of patients on parole and in arranging where possible for family care. The State allows $8 a week for every patient in family care, and the Commission considered that, when the cost of maintenance and new construction was allowed for, this was cheaper than institutional care. In the life of the hospital physician an undue part was played by administrative duties. The superintendent did a great deal of the work which should be the province of a business manager, an official who should take the place of the existing steward. In turn the clinical director found himself tied to a desk job. The best positions in the service were reserved for psychiatrists who became administrators; it should be possible to make a career also along clinical lines. There was too wide a gulf between the salary of the superintendent ($8,500–$10,500 per annum) and that of the first assistant, clinical director, and steward ($5,200–$6,450 per annum). Clinical and research interests should be fostered in other ways. To combat "ingrowing tendencies" each institution should have a travel study fund to enable members of the medical staff to attend important professional meetings and to visit centres where noteworthy medical work is being done. Other criticisms of existing arrangements deal with dietary, occupational therapy, accounting, business management, etc. Overcrowding of the mental hospitals is serious. The Commission considered that the medical care of the tuberculous was "nothing less than shocking," and it recommends establishing one or more special hospitals located near those maintained by the State Department of Health.

This report has itself met with strong criticisms,[3] into the merits of which we need not enter. It is, however, full of lessons for the British as well as the American psychiatrist and hospital administrator. The New York State hospitals include some of the best in the U.S.A., and as a group they are probably more advanced rather than more backward than any corresponding service in this country.

Dr. Charles Hill, Secretary of the B.M.A., is standing as an Independent candidate for the University of Cambridge at the coming election. One of the present representatives of the University, Prof. A. V. Hill, has intimated his intention of not standing again.

[1] *Quart J. Med.*, 1944, **13**, 137.

[1] *The Care of the Mentally Ill in the State of New York*, New York, 1944.
[2] Reported in *J. Amer. med. Ass.*, 1944, **126**, 437.
[3] W. L. Russell, *Amer. J. Psychiat.*, 1944, **101**, 184.

RHEUMATISM: POSTGRADUATE INSTRUCTION

BY

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Rheumatism may be conveniently defined as a painful disorder of the locomotor system the aetiology of which is obscure. Anatomically, this conception will embrace the joints, the fibrous tissues, and the neuromuscular system throughout the body. Symptomatically, it is no exaggeration to say that it may be applied to the occurrence of pain in every inch of the body—quite literally from the scalp to the sole of the foot.

Very early in my professional life I was impressed by the observation "Beware of rheumatism", by an experienced general physician in the course of his lecture on "Errors of Diagnosis." "Which of us," said he, "has not let out rheumatism with a scalpel?" Osteomyelitis is not the only serious error in differential diagnosis. We recall tuberculous arthritis and scurvy. The tabetic with lightning pains will present himself with the complaint of "rheumatism." Vague so-called rheumatic pains in the limbs will be recognized as the manifestation of trichiniasis by an astute observer who has noted oedema of the eyelids. As a contrast, there is the mistaken diagnosis of progressive muscular atrophy or a dystrophy when rheumatoid arthritis and trophic muscular changes were the correct explanation.

Cardiologists have associated the symptomatology of disease of the shoulder girdle or subacromial bursa with angina pectoris. The subjects of coronary arteriosclerosis have sometimes been regarded as suffering from these lesions for considerable periods. Pain more or less constant in the shoulder region—most commonly the left but often the right—has developed within an interval of three or four months after myocardial infarction and lasted for several years. The shoulder pain has even preceded coronary thrombosis for as long as a year. It is supposed that reflex hypertonus of the muscles of the shoulder girdle plays some part in the simulation of arthritic disease.

Charcot's joints, Paget's disease of bone, and, most tragic of all, malignant disease of the vertebrae or of the spinal cord are other lesions which have been mistakenly regarded as so-called rheumatism. Within a fortnight I saw three examples of carcinomatous metastases, two diagnosed as "sciatica" and one as "brachial neuritis." All three had been under the care of specialists at spas—men of experience at least as considerable as my own. I record these cases in no spirit of superiority, but as providing a salutary and humbling lesson. In all probability, how often must I have perpetrated similar mistakes!

And so while the specialist in rheumatism may be regarded by the layman as a man with rule-of-thumb methods of physical therapy—to us who reflect upon the traps and pitfalls, the difficulties of diagnosis, he must be recognized as an exceptionally gifted member of the profession, in his approach to every branch, to every system.

Aetiology

I ventured to begin with the generalization that aetiology is obscure. It is not surprising that every possible pathological element in the causation or reputed causation of recognized diseases and lesions has been presumed as an essential or necessary factor, with the unfortunate corollary that much work has been undertaken in watertight compartments instead of a determined campaign to correlate in the avoidance of rash generalizations.

We know that degenerative processes, the inevitable wear and tear of structures concerned in locomotion, must in some instances be responsible to an extent which has led to a fatalistic acceptance of the inevitable, the irrecoverable, and to a conclusion merely to make the best of a bad job. The influence of toxaemia waxes and wanes in popularity. Ruthless eradication of teeth, of tonsils, of gall-bladders, of appendices, of pelvic viscera, with resulting disappointment, has on the whole encouraged the complete abandonment of this therapeutic approach even if the diehards, deprived of any evidence of the influence of removable foci, still invoke the existence of hypothetical toxins in the interior of the gut.

Metabolic possibilities have naturally provided a wealth of hypotheses, whether along the lines of digestive insults with the presentation of all sorts of dietetic regimes, or on the principle of vitamin deficiencies.

Very naturally the endocrines have come in for their exaltation in importance; more especially as the relationship of arthritic lesions to menstruation, to pregnancy, and to the menopause is in some instances acceptable. Climatology one recalls only briefly in passing. It is a factor which almost everybody is prepared to accept as of some influence, but as one which with very rare exceptions has received the most trivial scientific exploitation.

Of recent date the psychosomatic side has been emphasized to an extent which makes an overwhelming appeal to the psychologically minded. That the emotional disturbances engendered by environmental burdens—poverty, grief, worry, and the like—have a distinct relationship to the onset and exacerbations of rheumatoid arthritis requires no emphasis in endorsement. But the majority of us pause to consider whether or no we shall accept so literally the explanation advanced of symbolic presentations of fibrositis as, for example, "feeling stiff and sore" over some grievance or frustration; of "unbending pride" through resentment; of "inability to stoop" or "lower oneself" to a certain course of action; of "getting it in the neck," both literally and figuratively; of representing through "sciatica" the desire to kick somebody, or through "brachial neuritis" to indulge in fisticuffs.

Yet something psychological may be advanced at least in partial explanation. The most materially minded will be prepared to accept the possibility of emotion leading to muscular spasm and tension, or inducing vasomotor changes which bring about localized areas of ischaemia or which lower the threshold of sensitiveness to external physical agents.

I have ventured to suggest that progress in therapy has been retarded by the tendency of men able and efficient in their particular spheres, yet unduly obsessed by their restricted applications, to reduce their sphere of usefulness by remaining in their watertight compartments. Each and every one of their methods of approach may well have a bearing more or less significant in individual instances, more or less applicable to the subject as a whole. Enthusiasm counts for much in explanation of the presentation of therapeutic virtues and the equally numerous pessimistic repudiations, when one specialist working with a new material or method reports dramatic successes and another reports complete failure.

The future health policy, the Government announces, is to include the treatment of rheumatic sufferers. To implement this intention it is proposed to establish and staff a number of rheumatism treatment centres. These will demand the provision of medical practitioners with special knowledge in the diagnosis and treatment of the rheumatic diseases, and it is the opinion of the Empire Rheumatism Council that it is desirable in the interests of the public health to institute postgraduate courses to enable a number of medical practitioners to acquire that special knowledge.

I need not refer to the nomenclature of "the rheumatic diseases" as agreed by the Committee on Chronic Rheumatic Diseases of the Royal College of Physicians (1936), but I venture to think that the brief survey I have presented of the scope of what may be legitimately included, and of the difficulties and possible pitfalls in differential diagnosis, sufficiently indicates the importance of instituting a comprehensive course of postgraduate training.

It is at this stage premature to describe the exact steps which must be taken in the selection of suitable trainees and to decide if they shall possess special qualifications that may be regarded as a *sine qua non*, or to do more for the present than anticipate that training grants will be available from public funds or from other available sources to permit of their whole-time attention. The facilities for appropriate instruction available at teaching hospitals, postgraduate schools, rheumatic treatment centres, orthopaedic centres, and the like are also matters which are at present under consideration; and the remuneration of teachers

employed must also be a necessary item in the scheme that is proposed.

But it may be permissible to give some indication of the syllabus envisaged and to state that, in order to attract the right type of entrant for this specialty, a preliminary course (three months) on general medicine at the Postgraduate College or similar institution should be undertaken especially with the encouragement to take a higher degree or diploma. A suggested syllabus of the course itself may now be outlined.

A Suggested Syllabus

Aetiology.—Survey of the recent trends in aetiological concepts in acute and chronic rheumatism and arthritis, including toxic, metabolic, climatic, dietetic, and traumatic factors and possibilities.

Pathology.—The classification and pathology of acute and chronic rheumatic diseases (including gout and spondylitis). Morbid anatomy and histology.

Applied Anatomy and Physiology.—(*a*) Surface anatomy: body mechanics and posture. (*b*) The structure and action of muscles and joints. (*c*) The skin and its reactions. (*d*) The blood, the circulation, and respiration as they affect the locomotor system. (*e*) The nervous system with reference to: (1) Segmental and peripheral nerve distribution. (2) Pain: the methods of causation, transmission, reference, and clinical application.

Radiological Investigation.—The normal radiology of bones and joints. The radiology of the rheumatic and pseudo-rheumatic diseases.

Clinical.—(The chief rheumatic diseases will be dealt with during the course in general medicine. Such "rheumatic symptoms" as occur in poliomyelitis, tuberculosis, gonorrhoea, osteomyelitis, leukaemia; etc., may be mentioned.) Standardized history-taking and the recording of symptoms. Orthopaedic aspects: postural and congenital abnormalities; chronic strain. Neurological aspects: neuritis, prolapsed disks, "hysterical joints," the mechanism of pain reference, muscular dystrophies; "sciatica."

Therapy.—Physical medicine: demonstrations of apparatus and methods in use; remedial exercises and physiological rest; the writing of prescriptions. Re-education of muscles and joints: occupational therapy. Reconstructive surgery of joints. Specialized methods of treatment: gold salts; procaine injections; aspiration of joints. Simple plaster work. Vaccines. Manipulation. The prophylaxis and treatment of acute rheumatic fever.

(N.B.—Practical experience of all the above should be acquired when working as a clinical assistant in rheumatic and orthopaedic special departments or hospitals.)

Social Medicine.—Environment; housing; dietetic, psychological, traumatic, industrial, and occupational factors.

Finally it may be pertinent to recall the close co-operation between orthopaedic specialists and "rheumatologists" advocated by the joint committee of the Empire Rheumatism Council and the British Orthopaedic Association, and the agreement of these bodies in their joint memorandum to the Ministry of Health as regards the organization and, where possible, as regards buildings, for the establishment of a decentralized scheme of out-patient and treatment centres depending upon a central hospital department. It would appear desirable for trainees to spend three months in an orthopaedic centre. The replacement of the title "orthopaedic physician" for "rheumatologist" might well be considered.

EMPIRE LEPROSY RELIEF ASSOCIATION

TWENTY-FIRST BIRTHDAY APPEAL

On April 26 at the Mansion House an appeal for £210,000 was launched at the coming-of-age meeting of the British Empire Leprosy Relief Association (B.E.L.R.A.)—that is, £10,000 for each year of its work. The Lord Mayor, who was accompanied by the Lady Mayoress, in opening the proceedings read a message from the King, who is patron of the association. Messages in support of the appeal were also read from the President, Lord Halifax, and from Lord Wavell, Viceroy and Governor-General of India.

Sir ALFRED BEIT, M.P., represented the Colonial Office in the absence through indisposition of the Colonial Secretary, Col. Oliver Stanley. He spoke of the long and fruitful collaboration and consultation of B.E.L.R.A. with the Colonial Governments, which would need not only to be sustained but extended in the future. Although the various Governments concerned had not been inactive, it could not be denied that measures for the relief of leprosy are still inadequate, and the Colonial Governments would desire to be associated with the tribute he was paying to the association. The newly passed Colonial Development and Welfare Act would be able to provide some of the required assistance, as in the case of the recent grant to Nigeria, but the Colonial Office hoped they would be able to rely on receiving help from B.E.L.R.A. in the future as in the past. The tours in the Colonies of medical secretaries of the association had been greatly appreciated, and further research work was essential. Last year he had witnessed for himself the leper settlement in Southern Rhodesia, with the remarkable record of 50% of cures as a general average. Equally good work had recently been carried out by Dr. Ernest Muir in the Trinidad Leper Settlement.

Achievements and Aims

Sir BERNARD BOURDILLON, chairman of the Executive Committee, paid a tribute to the three founders of the association—Sir Frank Carter, recently deceased, Sir Leonard Rogers, and the Rev. Frank Oldrieve, the first secretary. He need not go into the history and twenty-one years' work of B.E.L.R.A. because the visitors had been supplied with a pamphlet on the subject by Sir Leonard Rogers. He paid a tribute to the good work of Toc H volunteers inspired by their founder-padre. He considered the time to be overripe for a whole-hearted drive to exterminate leprosy in the British Empire. It was only through the investigations of the last twenty-one years that the immensity of the task had been realized with the discovery that there were probably about two million sufferers from leprosy in our Empire—a far larger number than had been previously suspected. Thirty years ago the only recognized treatment for lepers was what amounted to imprisonment for life; this led to concealment of cases. Now we knew that far the more common neural cases were seldom infective, and therefore did not need segregation, and that if the disease was taken early enough it was susceptible to treatment. For example, when he was acting as Governor of Ceylon fifteen years ago the 600 known lepers were isolated. Soon after, as the result of a visit from the association's medical expert, the new methods of control were introduced into Ceylon, and a survey increased the known numbers to over 3,500. Only the infective cases were isolated, and all received treatment, with the result that from 1941 onwards new cases had declined and a start had been made towards eliminating the disease from the island. Two and a half years ago he had visited, as Governor of Nigeria, two enormous mission leper settlements in Southern Nigeria, whose work had received 100% co-operation from the whole population. He had been so convinced that "here is a magnificent work on absolutely sound lines which must be extended until we gradually cover the whole country" that he got his Director of Medical Services to prepare a scheme for a capital expenditure of £58,000 and an annual expenditure of £40,000 for five years. Col. Stanley at once provided the money from the Colonial Development and Welfare Fund. But this sum would only suffice for the three worst-infected of the 24 Provinces of Nigeria, and one-third of the total lepers. Hence the necessity for the most liberal support of the present appeal of B.E.L.R.A., who wanted in addition to extend their methods to many other colonies. Twenty-one years ago the association raised only £4,000 by their first appeal, but subsequent efforts had enabled them to spend just over £100,000 on actual work in the field. He announced the receipt of a gracious gift from His Majesty. The United African Company had given the splendid sum of one thousand guineas, and Barclay's Bank and John Holt and Co. £500 each.

First-hand Experiences

Dr. E. MUIR spoke of his wartime work at the beautiful island leper settlement of Trinidad. He traced the spread of leprosy in the Western Hemisphere after its discovery. Good progress had been made since Trinidad had modified its stringent Leper Segregation Act to allow early cases of a mild type to be treated in special out-patient clinics, in accordance with B.E.L.R.A. principles. In India and Africa admission of lepers to the modern type of agricultural colonies was now regarded as a privilege; no compulsion was required. Conditions were much more difficult under the compulsory segregation system in Trinidad, but patient work had improved the atmosphere of that settlement. The introduction of improved methods of treatment had done more than anything else to remove the sting of compulsion. Last August an American firm had supplied him with a new synthetic sulphonamide, which had been reported to be effective in tuberculosis, and which had been favourably reported on in the U.S.A. Carvile Leper Settlement. This had given encouraging results in the hands of Muir at Trinidad and had increased the cheerfulness of the patients. With regard to the future he pointed out that B.E.L.R.A., in co-operation with various missionary societies, had been to a large extent responsible for pioneer work, and the demonstration of methods along which leprosy could be dealt with effectively. The arrangement for the Nigerian

Government to take over and extend much of the work there would free B.E.L.R.A. to concentrate on other parts of West and East Africa, the Sudan, and other colonies. Work was urgently needed to test new remedies, for the discovery of a real cure for advanced and highly infective cases did more than anything else to hasten the elimination of leprosy. The best birthday present to B.E.L.R.A. was the provision of ample funds to enable the open sore of leprosy to be healed throughout our Empire.

Mrs. GRAINGER, who has recently returned from many years of work in Nigeria, latterly spent at a missionary leper settlement with 15,000 patients under treatment, spoke eloquently on her experience. She emphasized the importance of caring for the children of the patients to save them from infection, and the joy of handing back their healthy children to mothers who were being discharged cured from the settlement. The proceedings terminated with a vote of thanks to the Lord Mayor and the Lady Mayoress moved by Sir LEONARD ROGERS.

MEDICAL SERVICES IN TRINIDAD

SEVERE CRITICISMS BY GOVERNOR'S COMMITTEE

A committee to review the medical and health policy of the colony of Trinidad and Tobago was appointed by the Acting Governor in August last. By arrangement with the Secretary of State and the medical authorities in Scotland, Col. Sir Alexander Russell was appointed chairman. Of the four other members of the committee two belonged to the medical and two to the legal profession. Evidence was given by many public bodies and associations, including the Northern Division of the Trinidad and Tobago Branch of the B.M.A., and by the oilfields companies and sugar estates, and the heads of Government Departments submitted memoranda. The report of the committee, which has been laid before the Legislative Council, contains as many as 160 recommendations.

"Grossly Deficient"

The committee finds the medical staff of the Health Department, as a whole, to be grossly deficient, though the deficiency is relatively less on the medical than on the public health side.

"When due allowance is made for the war, and the admitted shortage of medical men, there appears to have been no real effort, even before the war, to build up a staff sufficient to deal with both the usual and the more specialized aspects of curative medicine."

Apart from this, the committee found evidence of a certain "lack of keenness" and lack of *esprit de corps* and spirit of service among a considerable proportion of the medical staff of the Department. This deplorable situation, it believes, is largely due to the absence of a proper system of staff organization, and, as regards the hospitals, to the lack of a grade of house-physicians and house-surgeons. Another cause is the unsatisfactory method of granting study leave and of selecting officers for promotion. The specialist service is also declared to be very inadequate, while the district medical service is "depressing in the extreme," in some areas so deficient as to be virtually non-existent. There is no regular system of appointment of district medical officers, full-time, part-time, and contract officers being appointed in a haphazard manner without due regard to the size of the area or the needs of the population.

"We have heard numerous complaints of inaccessibility, hardship, exorbitant fees, callousness, and even sheer neglect in connexion with the district medical service; and it seems to us that these are bound to persist until the whole service is thoroughly reorganized and established on a satisfactory basis so as to ensure that even a poor labourer in a remote country district, in case of need, can obtain speedy and effective treatment."

On the public health side of the Health Department the usual activities are to be found, yet in the absence of a stated policy the public sees in these activities only spasmodic and uncorrelated effort. The committee adds that it

"did not receive that assistance we anticipated from witnesses as regards the formulation of a medical and public health policy. On the contrary, most of them, individuals as well as associations and societies, were principally concerned with, and devoted most of their written and oral evidence to, pointing out defects of the present system. In fact, it is true to say that we rarely received any constructive suggestions."

Proposals for Reorganization

The committee suggests as a long-term policy the reorganization of the medical service in accordance with certain proposals it lays down. Among its proposals is the appointment of a medical officer of health for each county, to have control of health staffs and to be responsible for all health activities in the area. One innovation suggested on the medical side is a united specialists' service for the whole of the British West Indies. It is considered that the present method of classifying medical officers in the colonial hospitals into Grades A, B, and C should be extended to all officers in the medical services, and a further grade D created to include house-physicians and house-surgeons. An officer should be up-graded to A only if he possesses an advanced degree, and to B only if he has taken a period of study leave and has gained an additional qualification from a British university.

On the question of private practice the committee says:

"We do not think it is the duty of the Government to provide medical service for the whole population; that is not a generally recognized Government function in any part of the world. But we think the policy of the Government should be to encourage the settlement of private general practitioners in rural and semi-rural areas, and one of the most certain methods of achieving this aim is to forbid private practice to all Government medical officers."

The only exceptions to this should be in certain scantily populated areas where it is unlikely that any private doctor would care to settle without a monetary inducement of some kind. It is affirmed unhesitatingly that the employment of part-time district medical officers is unsatisfactory and should cease at the earliest possible date. County and district medical officers should be fully occupied and have no time for private practice.

Other proposals are for a central advisory committee, the Director of Medical Services to be chairman, one member to be nominated from the Legislative Council, one to be nominated by the Northern and another by the Southern Division of the B.M.A. Branch, and one each to represent the Port-of-Spain and the San Fernando municipal councils. The committee recommends that all the sugar and oil companies should be required to provide a satisfactory medical service for their employees, and that the shipping and industrial interests of Port-of-Spain should provide a health centre, ambulance service, and full-time medical officer for the treatment of emergency cases arising among their workers.

Much public criticism has centred around the colonial hospital at Port-of-Spain.

"We have evidence to show that a number of the complaints are justified, some of the medical officers being equally responsible with the nurses in respect of delayed and careless treatment, lack of kindliness, and even neglect. . . . We have had evidence, which we accept, of a certain number of deplorable incidents which are bound to reflect on a hospital's good name."

On the other hand, many complaints are second-hand or third-hand stories. The committee believes that the general proposals made with regard to staffing will go far to improve conditions. The appointment of medical staff committees and the closer contacts which it is recommended that the director and deputy director should have with the staffs may do much to dispel suspicion and resentment. All the hospitals which the committee saw require complete reconstruction, and a very unfavourable opinion was formed of the district hospitals.

Many other recommendations are made concerning specific services, and appointments, promotion, and leave of medical officers. Finally, in place of the present Medical Board, it is proposed that a new controlling body, the Medical Council of Trinidad and Tobago, should be set up to take over the registration and discipline of medical practitioners. It should consist of twelve members, all belonging to the medical profession, nine of them elected by the registered medical practitioners of the colony, and the other three nominated by the Government.

Government's Reply

In a short covering memorandum the Government states that it has no desire to minimize the severity of the strictures on the medical services of the Colony, except in so far as they are due to war conditions and serious shortage of staff. On the contrary, the Government would not have instituted an inquiry if it had not expected such criticisms. But it explains that the shortcomings are not the result of financial parsimony. The amount expended on health services has increased by well over 50% during the last three years. Every effort will continue

to be made to secure more officers, for whom funds have already been provided, and the Council will be asked to vote further funds. But there must be no disappointment if some time elapses before this policy can be fully adopted in the medical department, since hitherto, notwithstanding most urgent representations, it has not been found possible to engage enough experienced administrative officers even for the secretariat.

On the question of the serious shortcomings revealed in the Colonial Hospital, Port-of-Spain, and in the district hospitals, it is stated that the initiative of the Director of Medical Services and of the Government in respect of discipline has been circumscribed by statutory restrictions, and it will be necessary to consider and submit amending legislation to the Council.

Reports of Societies

SULPHONAMIDES AND PENICILLIN IN URINARY DISEASE

A meeting of the Section of Urology of the Royal Society of Medicine was held on April 26, Mr. F. McG. LOUGHNANE presiding, for a discussion on the use of the sulphonamides and penicillin in urinary disease.

Wing-Cmdr. J. C. AINSWORTH-DAVIS said that the introduction of the sulphonamide compounds had proved to be the greatest advance yet made in urinary disinfection. The sulphonamides could be used for both acute and chronic infections, and acted most powerfully on organisms of the coliform, streptococcal (other than *faecalis*), and gonococcal groups. Six basic principles should be observed in their administration: (1) The initial dose, or two doses, to be large, in order to obtain the maximum concentration of the drug in the blood stream in the shortest possible time. (2) Sulphathiazole (which in his experience was the most useful of the compounds) should be administered 4-hourly for at least two days, and unless there were strong reasons to the contrary the patient should be awakened at night for this purpose. (3) A white blood count should be taken before beginning the course, and repeated on alternate days in order to guard against agranulocytosis. (4) Fluid intake during treatment should be increased to at least 5 pints in 24 hours to maintain the urinary output at a minimum of 3 or 4 pints. If the output fell below 2 pints in 24 hours, with pain in the loins and haematuria, blocking was suggested and treatment should cease. (5) Alkalis should be prescribed to be taken by mouth three times a day. (6) It was no longer necessary to withhold sulphur-containing foods such as eggs.

In severe infections endangering life the customary dose should be increased by 50%—that is, 1½ g. instead of 1 g.—and an intravenous injection of from 2 to 4 g. should be given as a preliminary measure. In mild infections or in prophylaxis against urethral fever the dose should be diminished by 50% (0.5 g. instead of 1 g.). For children up to 3 years the dose should be one-third the adult dose; from 4 to 10 years, one-half; and from 11 to 15 years, two-thirds.

Apart from some nausea, headache, and cyanosis there were three main complications which called for cessation of the drug: primary or acquired sensitivity, agranulocytosis, and blocking of renal tubules, pelves, and ureters with crystals. A mild degree of leucopenia need not cause alarm, but a rapid fall in the white blood count to below 4,000 should raise suspicion, and a fall to below 2,500 indicated agranulocytosis.* Blocking of renal tubules was due to deposition of crystals of sulphathiazole, which was one of the less soluble sulphonamides, and might occur at any time during treatment and had been known to follow small doses of 5 to 10 g. given by mouth or even one large preliminary injection. The speaker described what he called a ureteric "corkscrew," which, in cases of sulphathiazole anuria, he inserted first in one ureteric orifice and then in the other, giving it a clockwise twist to overcome the obstruction; on withdrawal it would bring with it a mass of crystals.

* A later speaker suggested that the term granulocytopenia" would be etymologically more correct, "agranulocytosis," strictly speaking, meaning total absence of white cells.

Penicillin in Urinary Infections

Dr. ROBERT CRUICKSHANK described the properties of penicillin and the organisms against which it was active. Its activity was unimpaired by blood or pus; it had no local or systemic toxicity, but it was unstable in weak solutions and was inactivated by acids or alkalis, by bacterial contaminants, and by heavy metals. He felt that it would be advantageous to keep a considerable degree of laboratory control over the use of penicillin. A medical man finding a case which he thought suitable for its administration should consult with his bacteriological colleague.

The two popular methods of administration were by intramuscular injection intermittently and by intramuscular drip continuously. The drug was rapidly excreted, and therefore if given intermittently it must be at frequent and regular intervals. An earlier view was that the only thing which could be done to delay excretion was to produce nephritis in the patient. Some advance had more recently been made by the use of oily excipients, and one of the amino-acids had also been tried. These methods might help to space out the doses. Intramuscular drip was now commonly used; intravenous drip had been tried but had a tendency to sclerose the veins, and most people, he thought, had given it up. Febrile reactions might be obtained with the use of penicillin, and therefore reliance must be placed upon a temperature chart.

The first and most obvious indication for penicillin therapy in urological infections was staphylococcal infection of the kidney. This was not a very common condition, but it was interesting to remember that after the last war, as a sequel to various injuries giving rise to staphylococcal infections, there was a great increase in perinephric abscess, and this might be repeated. The laboratory methods of diagnosis were: (1) examination of the urine, when the infecting staphylococcus would generally be found, and (2) the white cell count, which, if it got around 20,000 or over, was a strong presumptive sign of staphylococcal infection. In such cases early systemic treatment with penicillin should be recommended, treatment continuing until all clinical signs had disappeared and the urine had been clear for a definite period. Dr. Cruickshank showed the following table to indicate the comparative sensitivity of bacteria to penicillin in urine at *p*H 7.6:

Organism	Inhibitory Level of Penicillin Ratio
Staph. aureus	1/30 unit
Str. faecalis	3 units
B. proteus	8 "
B. coli	30–60 "

Limitations of Penicillin

Mr. CLIFFORD MORSON said that he had had the opportunity of treating a case, in collaboration with Dr. Cruickshank, of a severe *Staph. aureus* infection in which it was suggested that penicillin might be tried. The patient's symptoms were constant backache and frequency of micturition (every 30 minutes). The treatment consisted of 15,000 units of penicillin intramuscularly every four hours for five days. An interesting point was that after each injection the patient had a good deal of pain in the calf of the leg; but within 48 hours the result was dramatic: the urine became sterile (it had not been sterile for three years) and all the pain in the back disappeared. As each day passed the patient could hold his urine for a longer time, and on the fifth day he was holding it for two hours day and night. About the tenth day after the beginning of the treatment, however, and five days after its cessation he developed a severe *B. coli* infection, the urine being loaded with this organism; but no other organisms were present, and frequency was as great as before. Penicillin seemed to stimulate the growth of *B. coli*. Incidentally he could not agree with a statement in the Medical Research Council's report that *B. coli* was sensitive to the sulphonamides. The cases became symptomless, but still the urine contained *B. coli*.

Mr. H. P. WINSBURY-WHITE agreed with this last observation. A mild infection with *B. coli* could be got rid of by means of a sulphonamide, but it came back again. He added a word concerning the usefulness of the sulphonamides in prophylaxis in instrument cases generally. All were familiar with cases which required regular and frequent use of instruments, and no matter what care was exercised the patients were subject to mild attacks of fever. He had found a small dose of sulphon-

amide—2 g. a day for three or four days—to control that tendency.

Wing-Cmdr. A. W. BADENOCH said that at his R.A.F. hospital they had had a good deal of experience of penicillin, though not much in urological conditions; the field for penicillin in urology was very limited indeed. A few cases of *Staph. aureus* infection uncomplicated by an obstructive factor had responded remarkably well, clearing up in a day or two. They were kept on penicillin for a few days after the urine had become sterile and followed up at the end of the month. Out of rather more than 200 cases in which intramuscular drip had been used, 17 had developed abscesses at the site of the puncture. For this reason they had returned to intermittent injections, the number of which had been cut down and the dosage scaled up. By giving two doses a day of 50,000 units they had been able to get the same clinical results as with 3-hourly doses of 15,000 units.

Choice of Compounds

Mr. E. W. RICHES said that his objection to sulphathiazole was that it made the patient feel so extremely ill. He did not think it the best of the sulphonamides to use in urinary infections if consideration were given not only to its potency but to the way in which it was tolerated. He preferred sulphadiazine, given in the same doses; and although some patients were intolerant to sulphadiazine and vomited after it the number was much smaller than with any of the other sulphonamides. He agreed with what had been said about the return of *B. coli* infections, but he thought that in such cases, if a diligent search were made, some cause such as stasis, atony, or trauma in the urinary tract would be found. He preferred mandelic acid for a pure *B. coli* infection, and thought it more effective than any of the sulphonamides. He had seen penicillin used in a number of urinary cases, but in a spinal unit, where there were many complications. The greatest value of penicillin in these cases had been as an "umbrella" under which to operate. The post-operative course had been rather smoother when penicillin had been given immediately preceding the operation. He was sure that it was necessary to go on with penicillin longer than the temperature chart might indicate.

In further discussion Dr. R. A. O'BRIEN asked whether the leucocyte count was any guide to the safe period when to drop penicillin; also how far one could relieve the patient of the discomfort of frequent intramuscular injections. Dr. A. STANLEY suggesed that sulphamezathine was the safest of the compounds and was as effective as the others in urinary cases. Lady FLOREY said that the pain of intramuscular injection would be reduced when penicillin became more pure as a result of improvements in the manufacturing process. Meanwhile, a good technique on the part of the nursing staff would do much to abate the discomfort.

Wing-Cmdr. AINSWORTH-DAVIS, replying to the discussion, said that he fully agreed as to the value of a short course of sulphonamides before using instruments or before operation, followed by a post-instrumental or post-operative course; the results were very much better. Dr. CRUICKSHANK said that information received from Canada seemed to show that even with inert penicillin, as pure as it could be made, there was a good deal of pain, and there procaine was given as a routine measure. Intermittent muscular injection, with two of the night injections omitted, was, in his experience, preferred by patients to the continuous drip.

DIPHTHERIA ANTIGENS

At a meeting of the Section of Epidemiology and State Medicine of the Royal Society of Medicine on April 27, with Sir WELDON DALRYMPLE-CHAMPNEYS in the chair, an address was given by Sir PERCIVAL HARTLEY, of the National Institute for Medical Research, Hampstead, on diphtheria antigens, their preparation, properties, laboratory testing, and statutory control.

Historical Retrospect

In a short historical survey Sir Percival Hartley said that it was almost 25 years ago in that same Section that Sir Charles Martin communicated observations he had made in Rouen during the last war on the rate of disappearance of diphtheria bacilli from the throat in soldiers. Since then the outstanding event had been the clear demonstration that a considerable degree of protection to individuals and communities could be afforded by active immunization. Until 1913 there had been no simple way of finding out which members of the community needed protection and whether the measures which might be taken would be of any use for that purpose. In that year Schick described his famous test, which changed the whole situation, and Park, a great pioneer in this field, who had not liked the idea of injecting into children a material which caused paralysis in guinea-pigs, became one of the warmest defenders of the Schick test. At a ceremony in New York shortly before his death Park immunized the millionth child, and Schick the first of the second million.

Of all the prophylactics which had been used toxin-antitoxin caused the greatest anxiety to those who made it because the amount of toxin and antitoxin had to be so precisely adjusted. Accidents followed its use, and to those associated with the work the remarkable thing was not that they occurred but that they were so few. For many years until the preparation became obsolete every batch of toxin-antitoxin was tested in his own laboratory at Hampstead before its release was permitted. Some had always maintained that toxoid and not toxin should be the base of all antigens. In 1923 the successful immunization with a toxoid-antitoxin mixture was reported. This preparation had been largely superseded in recent years, but it played a useful part in those early days. It was employed almost entirely in this country. Then came the use of formalin in depriving diphtheria toxin of its toxicity, and for its ease in preparation and its safety the formol toxoid enjoyed wide popularity, while in some European countries and in Canada it was the antigen of choice. Its drawback was its liability to cause unpleasant local reactions, especially in adults. Toxoid-antitoxin floccules for active immunization became popular because the local reaction was only slight; the antigen was particularly suitable for the immunization of adults, and gave as a rule high Schick-conversion rates. In his own laboratory it was shown that while these floccule preparations made a very poor showing on guinea-pig tests for their antigenic activity, they made a good performance when administered to the human; it had then occurred to him that the tests which it was necessary to apply by law to diphtheria prophylactics did not permit this particular kind of antigen to display its qualities.

Alum-precipitated Toxoid

In 1926 Glenny and his colleagues showed that the addition of alum to formol toxoid gave an insoluble precipitate which had high antigenic properties. The antigenic activity of the toxoid was increased from 50 to 100 times by turning it into the insoluble A.P.T., which had advantages not possessed by other forms of prophylactics, and in its modern form was a relatively pure antigen. It was not particularly prone to cause local reactions in young persons, and for the primary immunization of the very young it was the antigen of choice. Its greatest merit was that it was effective in two doses, whereas other forms of prophylactic required three. During this war millions of children had received two injections, and, although it had not been possible to Schick-test them all, in control tests two spaced injections of A.P.T. had given a very high conversion rate. Opinions differed as to whether and when the Schick test should be applied in the immunization campaign, but if the pre- and post-Schick tests were to be omitted, it was with this antigen that this could be done with the greatest justification.

The progress towards active immunization against diphtheria (Sir Percival Hartley continued) had had a series of setbacks owing to fatal accidents following injection of antigen. In Texas in 1919 a number of children died after receiving what should have been a perfectly safe toxin-antitoxin but which contained toxin in amounts lethal to the human subject. These tragic instances created a profound impression and put back the clock, but they brought support to the claim then being worked out in this country for statutory control of certain therapeutic substances. The need had been shown most strikingly in the case of salvarsan; then the discovery of insulin, the demonstration of extreme variability in potency of pituitary extracts, and the whole trend of medical research all pointed in the same direction. It was evident that the manu-

facture, testing, and supply of specific remedies should not be left to the uncontrolled activities of inexperienced and ignorant persons. Under the Therapeutic Substances Act, 1925, accordingly, diphtheria prophylactics, among other things, might be prepared only by accredited licensees, and licences were granted only to those who could reach and maintain the very high standard demanded in the matter of expert staff and laboratories. All such preparations must conform to standards laid down in respect of purity, potency, and quality.

The Search for a Standard

Sir Percival Hartley confined himself to one aspect of this control—namely, potency. A number of difficulties would be resolved, he said, if potency could be assayed by comparative tests in relation to a standard, and the question had often been asked why, if difficulties of this kind had been overcome in the case of insulin and tuberculin, the arsphenamines, and the vitamins, the same could not be done in the case of diphtheria prophylactic. But the technical difficulties in the assay of antigens were very great. In England not one but several standards would be required, and the methods of comparative testing were very far from being precise.

In the spring of 1941 it was discovered that a brand of A.P.T. of low antigenic activity was being used in the national campaign, and laboratory tests at Hampstead confirmed the low Schick-conversion rates which were reported in the field. Though this A.P.T. was found later to be defective in other ways, these batches did comply with the requirements of the Therapeutic Substances Act, and so far as the potency tests were concerned it was clear that the Schedule itself was defective in ways that had not been anticipated. Primarily this defect was due to the attempt made in 1925 to bring all types of diphtheria prophylactic under the same regulations. In those early days of the Act, when the various prophylactics were reasonably similar in type and of the same order of activity, when antigens made in other countries had to be taken into consideration and brought within the scope of the Act, and when it was quite uncertain how many antigens would have to be legislated for altogether, this policy might have been justified. But with the advent of A.P.T. 50 to 100 times more active than those earlier antigens, these batches of very low potency, good enough to render guinea-pigs Schick-negative, but far below what was required for the immunization of man, could be passed into use.

This was a very serious matter, but it was faced; and action was taken by the Ministry of Health, by medical officers of health, by the licensing authority under the Therapeutic Substances Act, and by the manufacturers themselves and their expert advisers, and the worst consequences of this catastrophe were avoided. He described in detail the laboratory investigations which were carried out. As a result two rigorous requirements were laid down to which all A.P.T. must conform—namely, that the preparation should contain not less than the equivalent of 50 flocculation units of toxoid per c.cm., and that it should be shown that 10 guinea-pigs given two doses of one flocculation unit at an interval of a month must give an antitoxin production of not less than 2 units per c.cm., calculated on the geometric mean.

The results of a number of field and laboratory experiments on manufacturers' samples were shown. The laboratory adopted a standard which was an arbitrarily selected A.P.T., known to give a good showing in guinea-pigs, and subsequently in the field. The manufacturers' samples in this experiment satisfied the two requirements laid down. Arrangements were made for testing the standard in one or more schools alongside the manufacturers' sample, using so far as possible an equal number of children in the groups immunized, and then they were Schick-tested. The standard was found to do all that was expected of it, and by the tests at Hampstead all the samples fulfilled the requirements. This work had not yet been brought to an end, but those concerned felt themselves now on firmer ground than they had been for some time. With regard to the practical business of providing diphtheria prophylactic for the immunization of children, he did not think that any country in the world was better served than our own.

The remarks of speakers in the discussion which followed the address—Dr. R. A. O'Brien, Mr. A. T. Glenny, Dr. H. J. Parish, and others—were all in the vein of reminiscence.

Correspondence

An Undergraduate Medical School at Oxford

SIR,—The report of the Goodenough Committee has been received with little open criticism, partly because any medical school which refuses to fall in with its recommendations is likely to find itself at a considerable financial disadvantage. As Oxford graduates, however, we feel bound to put forward some criticisms of that section of the report which deals with the University of Oxford (Chapter 6, paras. 41–52, pp. 122 to 125).

Shorn of its trimmings the suggestion put forward by the university and apparently approved by the Goodenough report amounts to the foundation of an undergraduate clinical school to train "teachers, investigators, and consultants rather than general practitioners." This involves two assumptions which we believe to be quite unjustified: the first, that medical students before having started on the clinical period are in a position to determine what type of medical career they wish to take up; the second, that there is at this stage in their education any means of selecting those who are likely to prove efficient "teachers, investigators and consultants."

We teachers who have long been in close touch with undergraduate medical schools realize only too well that it is impossible to prognosticate the development of any particular medical student during his three years of clinical work. Some who have covered themselves with honours in the pre-clinical period fail lamentably as clinicians; others with chequered careers in their pre-clinical studies may ultimately prove quite outstanding both as clinicians and as teachers.

It must be remembered that some of the greatest figures in medicine—for example, Sir James Mackenzie—spent many years as general practitioners. It may well be that every potential consultant or teacher would benefit far more by a period in general practice than by three years of study in the "rarefied atmosphere" (*vide* Goodenough report, p. 124) of Oxford. Few undergraduates go down from Oxford without feelings of poignant regret, and many medical students at the impressionable age at which they normally leave Oxford would wish to remain there to complete their clinical studies. As a result the suggested undergraduate school would be likely to be filled mainly by those with sentimental attachments to Oxford. Those who, perhaps, with the assistance of their parents, took a broader view of their future medical education would continue to go to teaching hospitals in London or elsewhere.

It is probable that should such an undergraduate school as is envisaged in the Goodenough report come into being it would within a few years die of inanition. In the meantime, however, it might well have dealt a severe blow to the opportunities for research and postgraduate teaching which were visualized as the fruit of Viscount Nuffield's benefactions. The Nuffield professors were not selected with a view to their becoming teachers of undergraduates, and the strain of an undergraduate teaching school would necessarily considerably restrict their more vital functions. We trust that the university will not attempt to implement the recommendations in the report without further consideration.—We are, etc.,

G. H. BATEMAN.
G. E. BEAUMONT.
DENIS BRINTON.
W. D. W. BROOKS.
L. R. BROSTER.
L. GRAHAM BROWN.
MAURICE CAMPBELL.
J. J. CONYBEARE.
ERIC A. CROOK.
P. G. DOYNE.
TERENCE EAST.
CECIL FLEMMING.
MYLES L. FORMBY.
C. M. HINDS HOWELL.
NEILL HOBHOUSE.
THOMAS HUNT.
G. L. M. MCELLIGOTT.
GEORGE E. NELIGAN.
W. H. OGILVIE.
R. S. BRUCE PEARSON.
WILFRED J. PEARSON.
J. H. PEEL.
ARTHUR E. PORRITT.
MAURICE SHAW.
E. B. STRAUSS.
C. P. SYMONDS.
HENRY TIDY.
O. L. V. DE WESSELOW.

Chronic Otorrhoea

SIR,—Mr. Thacker Neville (April 28, p. 594) draws attention once more to the extremely satisfactory results obtained by the dry treatment of chronic otorrhoea. In 1931 I[1] recorded that over 80% of cases of chronic otorrhoea in school-children responded promptly to the daily aural insufflation of a powder consisting of 1% iodine in boric acid. In some cases cauterization of the sessile granulations by 50% silver nitrate solution was undertaken. I also recorded[2] the view that before any case of chronic otorrhoea is referred for operation at least 12 weeks' continuous treatment with the powder should be completed. The powder is made by thoroughly mixing the iodine crystals with the boric acid powder in a mortar and storing in a glass-stoppered bottle. Since 1931 the aurists to the L.C.C. (who annually treat some 4,000 cases of chronic otorrhoea in school-children) have used this powder with similar satisfactory results. Mr. Scott Stevenson has expressed the opinion that I had underestimated the good results of the treatment of chronic otorrhoea with this powder. The insufflation iodidi cum acidi borici is the formula used by the L.C.C. Since 1931 the powder treatment of chronic otorrhoea has spread and is generally accepted.

Until all writers on chronic otorrhoea classify their cases it is impossible to draw any deduction from statistics of their results. Dr. A. G. Wells,[3] chief aurist to the L.C.C., has drawn up the following classification, which I consider an excellent one:

1. Tympanic or tubo-tympanic infection (66% of all cases in school-children fall into this group). This is associated with a central perforation, small or large, temporary or permanent. It is this type of case which, with due attention to the causal nasopharyngeal infection, responds 100% to the dry treatment; in many cases the use of plain boric acid powder suffices. This type of case rarely becomes complicated and rarely requires operation on the mastoid.
2. Tympanic infection with granulations (9% of all cases in children). Where the granulations are sessile, repeated cauterization with 50% silver nitrate solution and the use of iodine-boric powder will cure over 50% of cases. Where the granulations are exuberant, conservative treatment is useless and operation is indicated.
3. Attic disease (4% of cases in children). Should there be no response to powder treatment in 12 weeks operation is indicated.
4. Aural polypi
5. Cholesteatoma } About 6% of all cases.

Both these types require operation forthwith. 50% of all intracranial complications of otorrhoea are associated with these lesions. If such cases are treated promptly by operation these complications do not occur.

The L.C.C. as a result of its thorough treatment of chronic otorrhoea in school-children over a period of years has literally wiped out the incidence of lateral sinus thrombosis, brain abscess, and meningitis arising from chronic otorrhoea. A personal experience of fifteen years as aurist to the L.C.C. and twenty years' hospital practice has revealed that all cases of intracranial complications associated with chronic otorrhoea have developed in patients in whom treatment has been neglected and no operation undertaken.

On the other hand chronic otorrhoea is also a preventable disease and is almost unknown in the well-to-do population. Wilfred Trotter stated that the tuberculous joint was a disease of the poor, and the same may be said of chronic otorrhoea. Prompt and active treatment of all cases of *acute* otorrhoea will prevent the development of *chronic* otorrhoea, and in attaining this end the use of conservative mastoid surgery should be exploited to the full, at an early stage of the causal acute infection.—I am, etc.,

London, W.1. N. ASHERSON.

REFERENCES
1 Asherson, N., *Lancet*, 1931, **2**, 630.
2 —— *Chronic Ear Discharge*, London, 1938.
3 *Annual Report of the L.C.C.*, 1933.

Newer Concepts of Breast-feeding

SIR,—I entirely agree with the first half of the letter by Mr. Eric Coldrey (April 14, p. 530) on this subject, and I would like to add other causes and remedies which I have found in advising a large number of mothers during this war and in successfully breast-feeding two babies myself.

(*a*) Worry and lack of rest. These have unfortunately been big factors: anxiety about husbands; all the worry of seeing about the baby's rations, extra milk, cod-liver oil and orange-juice, etc., which have to be dealt with very soon after arriving home; so much of this seems unavoidable, but advice from the doctor to have one hour's sleep in the afternoon and sit with the legs up while sewing in the evening can have a marked effect.

(*b*) Very full painful breasts when the milk first comes in, and 7 to 14 days later insufficient milk. If fluids are restricted on the third day after delivery when milk is first coming in and subsequently increased according to the merits of each case, the breasts scarcely become painful at all; the baby is not choked by getting the milk too quickly, and there is not the risk of pressure atrophy on the milk glands from too full breasts. Some mothers can take fluid in large quantities again on the 4th and 5th days, but in others, and especially multiparae, restriction may be necessary up to the 10th to 14th day. (I found this necessary with my second baby.)

(*c*) Decrease in quantity of milk when the mother first gets up and at one month when she is trying to undertake more household duties. The feeds which are commonly affected are the 2 p.m. and 10 p.m. ones, and from experience I have found (despite Dr. Coldrey's remarks to the contrary) that a 2-oz. complementary feed following one or both of these feeds will very often tide the mother over these periods provided everything possible is done to encourage the mother's milk and she is told that this is a temporary measure only and will be unnecessary in one to two weeks' time. The great advantage of not having a hungry crying baby in the afternoon and during the night is that the mother gets much more rest and ease of mind, which are such big factors in promoting lactation.

One last point. I don't know whether Dr. Coldrey erroneously used the word "sick" visitor for "health" visitor, but the person he describes closely resembles what are known in this country as "health visitors," and I would like to point out that he has made very sweeping statements on the evidence of one bad specimen of this type of highly qualified nurse. In my experience in this country I have not met one health visitor who did not take the utmost trouble to encourage every mother to breast-feed her baby, and it is, in fact, in the essence of their teaching.—I am, etc.,

Dorking, Surrey. MARY C. JEFFRIES.

Women in Labour

SIR,—Dr. John Elam's letter (April 7, p. 495) draws attention to a matter which should, I feel, give reason for some heart-searching in the profession.

The necessarily dispassionate detachment with which the doctor makes his diagnosis and devises treatment is too often exaggerated into a completely, though not consciously, callous attitude to the distress and "humanity" of his patient. This is to be seen nowhere so regularly and so markedly as it is in the field of midwifery. It seems that those whose professional life is concerned with women in labour, through the presence of severe pain as a constant background to their work, unconsciously come to accept it as inevitable and to lose any sense of reaction against it.

While my ship was in an American port recently I was privileged to attend the course in continuous caudal analgesia at the Pennsylvania Lying-in Hospital, Philadelphia, conducted by the originators of this continuous method, Drs. R. A. Hingson and W. B. Edwards. Their results in the relief of pain in labour are dramatic and complete. The method, as they teach, has definite limitations and does somewhat alter the normal course of labour; it does call for increased time and skill from the obstetrician and anaesthetist. This would seem to be a worthwhile price to pay for the relief of one of the severest, and certainly most frequent, pains with which Nature afflicts our race. If men and all women were called upon to bear it I have no doubt that this statement would meet with virtually unanimous agreement.

In May, 1944, Dr. Hingson could state that more than 30,000 births had been managed with this technique in more than half the countries of the world (*Amer. J. Obstet. Gynec.*, **47**, No. 5), and it can surely be pronounced past any merely "experimental" stage. In March, 1945, I can find one British hospital in which the technique has been attempted, and there courageously under considerable difficulties. I can find no other evidence of active interest elsewhere.

In reply to Dr. Elam's very understandable challenge in his closing sentence I would like to assure him that there are very many of us representing "youth," but whose fingers are being kept far from the "helm" by the exigencies of the three Services. We are trying to keep alive in ourselves, in frustrating circumstances and with a wholly nebulous future, that spirit of practical idealism so well exemplified by his letter.—I am, etc.,

T. B. FITZGERALD,
Surg. Lieut.-Cmdr., R.N.V.R.

SIR,—I write in support of Dr. John Elam's (April 7, p. 495) and Dr. R. J. Minnitt's (April 28, p. 607) comments on gas–air analgesia. Publicity in the newspapers has impressed the midwives and their authorities with the necessity for relieving pain in labour, but their training in such methods as are available is often farcical. I agree with Dr. Minnitt that until there is a standardized curriculum for special instruction and a *central* examination instituted it is impossible for reasonable standards to be maintained, and the present methods of analgesia are merely brought into discredit.—I am, etc.,

London, W.1. K. G. LLOYD-WILLIAMS.

SIR,—The various viewpoints expressed on this subject in recent letters have been most interesting. When all is said and done, however, there are five factors which govern the present lamentable state of analgesia in labour: apathy, conservatism, prejudice, lack of apparatus or facilities, and lack of anaesthetists. Of these, the first three are by far the most important, as they govern—or rather misgovern—*policy*, and without a progressive policy nothing spectacular will ever be done about the last two.

With regard to apathy and conservatism, I well remember watching the face of a certain midwife during a Caesarean section under caudal analgesia. I was not then very conversant with the technique, and analgesia was not as perfect as I would have wished; consequently the patient suffered some mild discomfort during the latter stages of the operation. The attendant midwife wore an expression of considerable alarm, although an hour later she exhibited no concern whatever over the agony of a young and frightened primipara in labour. She was conditioned to perfect anaesthesia in the operating theatre and to imperfect analgesia—or none at all—in the labour ward, and was completely unaware of the inconsistency of her attitude.

Prejudice was once discussed by Lord Lister in the following manner:

> "When I was a little boy I used to imagine that prejudice was a thing peculiar to some individuals. But, alas! I have since learned that we are all under its influence, and that it is only a question of degree. But let us ever contend against it: and remembering that the glorious truth is always present let us strive patiently and humbly to discover it." (Graduation Address—1876.)

Were all of us concerned to search our hearts in the light of these words I feel sure that many more women in labour would have an easier time; and that newer methods of securing analgesia would come in for less ill-informed criticism.—I am, etc.,

Sutton, Surrey. A. H. GALLEY,

SIR,—"Mother and Doctor" (April 28, p. 608) hits the nail on the head when she says that the majority of people in attendance at a labour seem to imagine that the patient is "making a fuss."

Having quite recently "strafed" a midwife who, though she had four children of her own, criticized my giving analgesics in labour, I feel that some midwives take an almost sadistic joy in withholding sedatives from mothers in labour. Although I have made real efforts to have sedatives available in the labour ward for every midwifery case of mine, I find the nurse nearly always has a reason for not giving it. The usual answers are that it means doing an extra P.V. to see how far on the patient is or that "the mother is having good pains and coming on fine without it." As a mere male I cannot understand this callous attitude on the part of one woman to another which seems to develop as soon as a midwife enters an institution or maternity home.

Out on the "District" things are different: the nurse treats the mother as a real charge on her sympathies, and if she knows the doctor is anxious to relieve the pains of labour she very soon lets the doctor know that she is willing to co-operate, and will follow to the letter instructions given for administration of a sedative.

I do not mean to put *all* the blame for the lack of help in the relief of labour pains at the door of the nurse, but when in my own experience I have seen drugs withheld when they were actually freely available I feel the nurse's outlook on pain must be sadly warped. Why the difference in attitude between hospital and district nursing? I cannot imagine the reason.—I am, etc.,

Crewe. J. K. B. WADDINGTON.

SIR,—On what authority or evidence does your correspondent "Mother and Doctor" make the extraordinary allegation that nurses in charge of women in labour have "often neither the knowledge *nor the desire* to mitigate the suffering"? (my italics). Any lack of knowledge is not the fault but rather the misfortune of the nurse. To state that members of the nursing profession do not wish to save their patients all possible suffering is a slander which cannot be allowed to go unchallenged. Such unsupported statements recall Kipling's "Female of the Species": "Unprovoked and awful charges, even so the she-bear fights; speech that rips, corrodes, and poisons, even so the cobra bites."—I am, etc.,

Kirkconnel. BOWMAN EDGAR.

Detection of Nicotinic Acid Deficiency

SIR,—I read with great interest your annotation on this subject (April 21, p. 561). I feel compelled, however, to make a few comments on a number of minor errors, and particularly on the last sentence of your article.

The minor errors are: (*a*) It was not Coulson, Ellinger, and Holden[1] but Sarrett[2] and Huff and Perlzweig[3] who proved that most of the so-called trigonelline found by earlier methods is really nicotinamide methochloride. (*b*) Ellinger and Coulson[4] found that not only nicotinamide methochloride but also the genuine nicotinamide metabolite in urine is non-fluorescent. (*c*) Nájjar, White, and Scott[5] did not "isolate F_2 in crystalline form," but obtained crystals from an F_2 concentrate, the analysis of the crystals yielding results not corresponding to the postulated formula. There is no evidence in favour but some against F_2 being a butyl ether of N-methyl nicotinamide-carbinol (Ellinger[6]). (*d*) Najjar[7] in his latest paper "proposed a test . . . based on the measurement of N-methyl nicotinamide chloride in the urine instead of the fluorimetric measurement of F_2." He uses this fluorimetric measurement, but compares the fluorescence intensity of F_2 with that of a fluorescent standard derived from nicotinamide methochloride instead of a quinine sulphate standard; this had already been done earlier by Huff and Perlzweig[8] and Coulson, Ellinger, and Holden.[1] (*e*) The minimum nicotinamide methochloride output in normal people after the intake of 100 mg. nicotinamide is considered by Najjar[7] to be "2.1 g."; 2.1 mg. is, of course, the correct value.

In the conclusion it was stated that "we still have no simple laboratory method for estimating the level of nicotinic acid nutrition in man." This conclusion is based: (*a*) on the observation of Ellinger and Coulson[4] that the extent of the elimination of nicotinamide methochloride depends on a number of factors other than the intake of nicotinic acid, such as exercise, food, the presence of methyl donators in the tissues, and the efficiency of the methylating mechanism of the body; and (*b*) on the failure of Sargent, Robinson, and Johnson[9] and Mickelsen[10] to find an increase in nicotinamide methochloride output after nicotinamide intake. The results of these last two papers disagree with all the findings of other investigators, most of which are not quoted in your annotation. Moreover, the findings of Sargent, Robinson, and Johnson are valueless, as they have been carried out with an obsolete method already abandoned by its author, Najjar. The values given by them for normal people are in the order of one-hundredth of those found with three different reliable methods by numerous other workers, and the estimation of the response to ingested nicotinamide was carried out on 1- or 3-hour samples 12 hours after the intake of nicotinamide, when at least 90% of it was eliminated. Mickelsen[10] and Mickelsen and Erickson[11] did not compare the

response to different amounts of nicotinic acid in the same person, but in different persons, and tried too small amounts to give a discernible rise in nicotinamide output (Ellinger and Coulson[4]). Exercise and food intake can be controlled during the testing period. Lack of sufficient available methyl-donators and damage to the methylating mechanism as might be present in certain liver diseases (Ellinger and Benesch[12]) might reduce the specificity of the test to a certain degree; but both these facts can be ascertained.

No direct relation between nicotinamide intake—dietary or extradietary—and nicotinamide methochloride elimination can, however, be expected since an overwhelming proportion of the nicotinamide requirement of the human body is covered, not by the dietary intake but by the release of this substance by the intestinal flora (Ellinger, Coulson, and Benesch[13]; Ellinger, Benesch, and Kay[14]). The nicotinamide methochloride elimination in urine provides, however, a solid basis for the assessment of the level of the nicotinamide state of the human body. Three methods can be used: the estimation of the basic 24-hour output without extradietary intake of nicotinamide, the response to a single dose, or to 4 or 5 doses of nicotinamide on consecutive days. Investigations carried out by various workers using one or more of these methods (Huff and Perlzweig,[3] Ellinger and Coulson,[4] Ellinger, Coulson, and Benesch,[13] Ruffin, Cayer, and Perlzweig,[15] Coulson, Ellinger, and Smart,[16] Ellinger, Benesch, and Kay,[14] Ellinger, Benesch, and Hardwick,[17] and Hochberg, Melnick, and Oser[18]) provide values for the average basic nicotinamide methochloride output and for the responses to ingested nicotinamide in healthy man, which are in good agreement in spite of the great individual fluctuations of the nicotinamide methochloride elimination, and in spite of the fact that the nicotinamide methochloride assay in the urine was carried out by at least three entirely different methods. When cases with clinical symptoms of nicotinamide deficiency were examined[14 15 17] much (50 to 80%) lower values for both average basic output and response to ingested nicotinamide were observed.

This agreement and the great differences between healthy and deficient people prove the reliability of the method if all recommended precautions are taken.—I am, etc.,

Lister Institute of Preventive Medicine, London, S.W.1. P. ELLINGER.

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Infection from Dead Teeth

SIR,—I read the article on pulpless teeth by Prof. E. Sprawson and others (April 21, p. 551). I will not quarrel with what is written, but I would like to point out a few omissions.

1. The loss of the nerve supply of a tooth should render the tooth subject to trophic changes and more liable to infection and less able to fight back. This is true in syringomyelia and tabes. Why is it always neglected by writers on dead teeth?

2. The sterilization of root canal does not guarantee sterility of dentinal tubules. The authors by implication say that "if you can be sure of a sterile root canal carry on the vicious practice of filling dead teeth." And yet it is admitted that it is next to impossible to check the harm to general health done by these foci of infection. The *x* rays are useless, and duodenal or gastric ulcer or rheumatism or anaemias can always be seen by doctors. Dentists do the damage, and doctors have to do the salvaging. Incidentally doctors are now arguing openly thus: extraction of bad teeth does not cure, so why extract? forgetting that to cure a cut throat you have to do more than remove a razor!

I would like to ask the authors the following questions: (*a*) How many pulpless teeth have they examined after five years from the date of filling the roots and how many were found sterile? (*b*) What number of people with dead teeth have been examined completely—i.e., by test meals, *x* rays, blood counts, etc.—after ten years, and what is the standard of health in them as compared with similar class without dead teeth? Obviously a "follow-through" is most essential for the dental profession if it wishes to remain part of the healing profession; otherwise it is likely to become no more than a manicuring or plumbing "profession."

So far as I can make out the average dentist's standard is, "The patient is satisfied." With this as his motto no one can accuse him of aiming too high. In my view it would be a service to humanity if leaders like Prof. Sprawson condemned without qualification all root fillings.—I am, etc.,

London, N.5. K. MALIK.

Hearing Aids

SIR,—The letter of Mr. O. C. Leadbitter (April 28, p. 210), president of the Hearing Aid Manufacturers Association, raises an issue of national importance. A good hearing aid to-day costs about £20 to £30, and it appears that we may not look forward to any considerable reduction. This will be a severe blow to the deafened and to those doctors and social workers who have devoted themselves to this problem.

Mr. Leadbitter speaks with undoubted authority, and I am happy to pay tribute to him and his fellow manufacturers. The development of the modern hearing aid is largely due to the enterprise of his association, and the deafened have much to be grateful for. It must be remembered, none the less, that business firms, however well-meaning, cannot run at a loss, and in view of the present impasse it behoves us to consider in what way their function may be supplemented. The cost of a hearing aid may be allocated as follows: (*a*) Components—primary cost of, (*b*) distribution, (*c*) research, (*d*) Government taxes, (*e*) profits.

(*a*) *The Components* in a three-valve hearing aid may be listed as follows: (i) container, (ii) batteries, (iii) telephone, (iv) microphone, (v) valves, (vi) transformer, (vii) potentiometer volume control, (viii) chokes and condensers for intervalve couplings. The circuit is simple and standard. Most of these components are manufactured by primary producing companies. It is, in fact, possible for a "hearing-aid" manufacturer to purvey an instrument without having himself produced a single component.

(*b*) *Distribution.*—This must be subdivided again into (i) advertisement, (ii) sales, (iii) maintenance. It is not easy to comment without prejudice on these features, but it is certainly to be deprecated that the cost of an instrument should in any way be enhanced by the sterile element of private advertising. A similar criticism applies to sales. Shop rentals, salaries, and commissions must all be paid for, and the private manufacturer has perforce to establish his centres at strategic points. In a few large towns unnecessary overlapping occurs, whilst large areas are left badly provided for. Maintenance is a heavy burden. Many patients have already written to you feelingly on this point.

(*c*) *Research.*—Much remains to be done in this direction, and the medical profession is admittedly partly to blame. The technical problems are clearly recognized. Components must be reduced to minimum size compatible with efficiency and consistency. Modern service equipment already incorporates many such improved units which should be made available without further delay. Adequate co-ordination between clinician and physicist is unfortunately still lacking. Much remains to be done in the correlation of patient and instrument.

(*d*) *Government Taxes.*—It would be interesting to know how much these amount to, and it is difficult to believe that enlightened public opinion will tolerate their continued imposition. It should surely not be impossible to abolish purchase and similar taxes in such a deserving cause.

(*e*) *Profits.*—The above analysis contains many implied criticisms of a destructive nature, and it may well be asked what constructive proposals are available. It behoves us to await the authoritative findings of the four committees to which Mr. Leadbitter has already referred, but as these are not yet available the following expression of a purely individual opinion is perhaps permissible.

(1) I believe that the hearing-aid manufacturer would welcome the opportunity of producing a first-class instrument at a reasonable price if he could be relieved of the responsibility of distributing it.

(2) Advertisement—in so far as it is at all necessary—should be in the hands of the National Institute for the Deaf and related bodies.

(3) Distribution should be undertaken by regional hearing-aid centres. These are urgently needed and should be opened in every large town. The late Dr. Tookey Kerridge did much pioneer work in this direction, and the achievements of Drs. Ewing and Littler in Manchester cannot be too highly praised. Individual efforts, however, cannot cope with this nation-wide problem. Many more

clinics must be established. Every deafened individual should be able to make contact with such a clinic. Provision should be made not only for testing but also for supplying and maintaining the most suitable instrument.

Standardization is essential, and this brings us to the question of research. I do not wish to digress into technical details, but I am firmly of the opinion that no more than two, or at most three, different models of valve instrument are justifiable. Competitive private production unfortunately results in multiplicity of instruments which merely differ in inessentials, such as plugs, shape of box, and so on. Further research is essential, and in this the otologist must collaborate with the physicist. It is imperative to produce adequate testing instruments. The pure-tone audiometer is valuable but inadequate. We urgently need standardized intelligibility tests. The physicist must design and produce his models with accurate specification of performance, and the otologist must support him in assessing the value of each model in different types of deafness. In this way it should be possible to produce standardized instruments at less than half the present cost. Blue-prints could be circularized widely so that simple replacements and running repairs could be done by any radio shop, while the original sale would be made on the basis of adequate intelligibility tests in the regional centre.

Such a scheme is undoubtedly a counsel of perfection. The difficulties are many and obvious, but it is clear that the good will of all parties is not lacking, and under the authoritative guidance of the present official bodies we may look forward to an adequate solution of this grave problem.—I am, etc.,

Liverpool. A TUMARKIN.

Prolonged Use of Minimal Doses of Sulphonamides

SIR,—It is rightly recommended in acute infections that where sulphonamide chemotherapy is used it should be administered in full doses, and that the blood concentration should be kept at an efficient bacteriostatic level for the duration of the course, which is limited usually to 7 or 8 days. The question of the use of sulphonamide drugs in chronic or subacute conditions has received little attention in the published literature, and the following observations may not be without interest.

Helmholz in the *Proceedings of the Special Meeting of the Mayo Clinic* (1941, **16**, 145) reported the use of small doses of sulphathiazole in the treatment of a case of chronic urinary tract infection. He found that quite low concentrations (4 to 5 mg. per 100 c.cm.) of sulphathiazole in the urine were sufficient to keep the infection under control, and this was given without any ill effect for a period of 7 weeks up to the time of writing. This concentration was obtained by administering less than 0.4 g. of sulphathiazole by mouth per day. There are records of other cases where an even smaller dosage has been effective and has been given without untoward reaction for very much longer periods of time. Although brief mention is made of it in the M.R.C. pamphlet No. 10, entitled "The Medical Use of Sulphonamides," on page 21, it is evident that this method of dealing with chronic and subacute urinary infection is not well known, and one feels that it is worthy of emphasis.

Among other conditions of urinary infection where the method might be employed with effect are certain cases of pyelitis of pregnancy; as a rule early dosage of sulphathiazole (about 4 g.) per day for four days will clear up the condition, but in a certain number of cases this is followed by relapse and the course has to be repeated sometimes as many as three or four times. It is suggested that in cases where a relapse has occurred the treatment should be recommended with a dose of about 2 g. sulphathiazole per day for two to three days, and this gradually reduced to as small a dose as will keep the infection under control and the urine free from pus. This dosage, which may be as low as 1/2 g. every day, may be continued for 4 to 8 weeks until about the 30th week of pregnancy, when the condition tends to resolve naturally. In the case quoted sulphathiazole was used, although it would appear that sulphadiazine would be equally, if not more, effective in view of its slower rate of excretion.

It will thus be seen that the quantity of drug administered is certainly not more than 3½ g. per week, and therefore the amount given in four weeks is less than that given in the normal course (16 g. in 4 days). The adoption of this technique has, one feels, much to support it and would appear to offer a useful means of overcoming the associated toxaemia, anaemia, discomfort, and, in many cases, the inconvenience of a stay in hospital.

Three objections may be cited against the method, the most important being the possibility of producing drug sensitivity. It is inevitable that a small number of cases will be so affected, but the incidence is likely to be less than 5% judging by the published figures. In any case sensitization, if it is going to occur, is most likely to do so on or about the 8th day of administration, and by the continued exhibition of small doses (Tate and Klorfajn, *Lancet*, 1944, **2**, 553) the patient may be desensitized.

The second objection is the possibility of blood dyscrasia, but this is extremely unlikely and can be guarded against by regular medical supervision. The third objection, theoretically possible but extremely improbable, is harmful effect of the drug on the foetus. There has been no literature published to suggest, however, that even where prolonged and vigorous courses of sulphonamide chemotherapy have been given during pregnancy there is any untoward effect on the foetus. In the dosage described the amount of sulphathiazole entering the foetal circulation must be so small that the possibility of damage can be discounted.

Pyelitis of pregnancy is only cited as one example of where small and long-continued doses of sulphathiazole may be usefully employed for what virtually is a temporary chronic urinary bacilluria. Patients with indwelling catheters come into the same category, and there are private reports of the value of this method in patients with prolonged urinary infection where no underlying pathological condition can be found. In these cases or where surgical interference is not possible, prolonged use of small doses of sulphathiazole has proved effective. A dosage of the same order can make old age much more tolerable for the unfortunate victim of prostatic hypertrophy, nocturnal frequency being markedly reduced.

I am informed that dermatitis herpetiformis is an example where the same therapy has proved of value, although it seems possible that penicillin may be more effective in the latter condition.—I am, etc.,

Medical Department, May & Baker, Ltd. R. J. EADIE.

Sulphonamides and Measles

SIR,—I was very interested in Dr. Frankland West's letter on the above (April 21, p. 567). During the recent epidemic of measles I used sulphathiazole as a routine in about 70 cases, of which only two developed pneumonia. (These, however, made a rapid recovery.) The dosage for children of 1 to 6 years was 1/4 tablet four-hourly.

My observations have not shown that the present epidemic has been any less severe than any of the epidemics during the last ten years.—I am, etc.,

London, N.W.10. L. SHELDON.

Nurses and Tuberculosis

SIR,—You recently afforded me the courtesy of your *Journal* (March 24, p. 424) for a letter on this subject. The General Nursing Council for England and Wales, of which I am an elected member, has to-day (April 27) made it a requirement of hospitals approved as training schools for nurses that their student nurses shall be medically examined, including *x*-ray examination of the chest, either shortly before or on entry to training, the *x*-ray examination to be repeated at intervals of not more than 12 months. The Council also recommended the adoption in all training schools of the Memorandum on the Supervision of Nurses' Health issued by King Edward's Fund for London.

An important milestone in safeguarding nurses' health and improving living conditions has thus been passed. These measures will help, but nothing short of an entirely new approach to the training of nurses will effectively stem the 60% leakage, which is the cause of the shortage of nurses. Over 20,000 entrants have to be recruited each year in order to provide the average of 7,000 nurses who become State-registered annually and qualified to practise nursing.—I am, etc.,

London, W.2. EVELYN C. PEARCE.

Shall We Nationalize Medicine?

SIR,—Dr. Charles Franklyn's letter (April 21, p. 570) implies there are only two alternatives from which to choose, "Shall we nationalize medicine?" or "Shall we commercialize medicine?" He seems to have been unfortunate since leaving the same hospital as myself—St. Thomas's. He draws a picture of practice to-day as being a sheer commercial "ramp." This, I am convinced, is incorrect. The vast majority of medical men are honest, hard-working, and friendly to each other. The average practitioner spends most of his professional life in one place, and does not build his reputation upon the sands of sharp practice.

After a period of Service medicine in the last war, house appointments subsequently, and general practice in this town since, I state emphatically that I have experienced the same friendly spirit in all three, and that whatever competition exists is co-operative and not "cut-throat." We all want to try to find the best way of bringing the best help to the greatest number, but ordinary practitioners like myself begin to have grave and serious doubts when zealous planners of Dr. Franklyn's type start bleating about "an assured position and an allotted task." Allotted by whom?—I am, etc.,

Bournemouth. E. D. GRANGER.

Obituary

GARNETT WRIGHT, M.B., F.R.C.S.

We regret to anounce that Mr. Garnett Wright died on April 29 at the Salford Royal Hospital, to which he was for many years honorary surgeon. He joined the B.M.A. in 1907 and held office as vice-president of the Section of Surgery at the Manchester Annual Meeting in 1929.

He received his medical education at Edinburgh University, and after winning prizes and medals during his student career graduated M.B., Ch.B. with honours in 1900. He then came south and for six years held resident surgical posts at Weston-super-Mare, Wolverhampton, and Stafford, at Ancoats Hospital, Manchester, and finally at the Leicester Royal Infirmary. He then settled in Manchester in consulting practice as honorary surgeon to Ancoats Hospital. At a later date he transferred his work to a greater sphere of experience at the Salford Royal Hospital. While working in house appointments he obtained the F.R.C.S. diploma in 1905. No surgeon from other schools than Manchester who settled in that city won such success in professional life. Of quiet, unassuming nature, he met with friendship from the physicians and surgeons and gained the good opinion and confidence of new graduates by his teaching power, sound judgment, proved surgical skill, and attractive personality and presence. He took part in the scientific discussions held in Manchester, and was in turn president of the Pathological Society and the Medical Society; as a committeeman and president he exercised unusual influence for good in their welfare and success. He was honorary surgeon to the Royal Deaf Schools at Old Trafford, where his work was greatly appreciated, and consulting surgeon to the Eccles and Patricroft Hospital.

Garnett Wright was particularly interested in abdominal surgery, writing several papers on gastro-jejunal and allied subjects in the medical and surgical journals. He was very successful in his operations on the thyroid gland and took this subject, with a review of it, for his presidential address to the Manchester Medical Society in 1936. At the Victoria University of Manchester he held appointments at different times as lecturer in surgical pathology and operative surgery and as assistant lecturer in the whole subject. He was a Fellow of the Association of Surgeons of Great Britain, and in 1935 was responsible for publishing the report of its collective inquiry into gastro-jejunal ulceration.

On March 19 news was received in Preston that Lieut.-Col. WILLIAM SIMPSON had died in a yachting accident in Jamaica. A colleague writes: Recalling his intense and tireless energy, his sudden death came as a severe shock to all the medical men in the Preston district. He came to Preston in 1938 as the first obstetric consultant to the new maternity hospital of the Preston Royal Infirmary, and the great success of this modern, well-equipped hospital was in large measure due to his skill, his energy, and his personality. His work at the hospital, in neighbouring hospitals, in the clinics of the Lancashire County Council and the Preston Corporation, satisfied the most captious critic. Tall and powerfully built, he gave doctors and patients alike that feeling of confidence which is the hall mark of the perfect consultant. In spite of successive nights spent in dealing with emergency cases, he appeared full of energy and vitality. He was always ready to help the practitioner in his obstetric difficulties, and his practice of midwifery was a pleasure to see. Before coming to Preston he had held appointments in Glasgow, London, and Barnsley. In the last-named town he had been associated with Dr. F. A. Sharpe, the late M.O.H. of Preston, who predeceased him but a few weeks. A graduate of Glasgow in 1923, he proceeded to the M.D. in 1927, and obtained the D.R.C.O.G. in 1936. He was interested in the Territorial Army, and at the beginning of the war held the rank of major. He left Preston in the latter part of 1940 to take up his duties in the R.A.M.C., and at the time of his death he was the A.D.M.S. in the Bermudas. He died in his early forties. His friends will cherish his memory and mourn the passing of one whom they could ill afford to lose: in life respected, in death regretted, by all whom he had served so well.

We regret to announce the death of Dr. HORATIO NELSON BARON on March 25, at the age of 86, at Orford, Suffolk, where he had been in practice for 45 years. Born at Hungerford, Berkshire, he was educated at Blue Coat School and Queen's College, Oxford, and at King's College Hospital, qualifying M.R.C.S., L.R.C.P. in 1888. After serving for a time as a ship surgeon he settled in practice at Pailton, near Rugby, and went to Orford in 1900. He joined the B.M.A. in 1890, and was chairman of the former South Suffolk Division in 1926–7. Other appointments held by him were: vice-chairman of the East Suffolk Insurance Committee and chairman of the East Suffolk Panel Committee. He was a member of the East Suffolk County Council. Dr. Baron was a man devoted to his profession and much loved by a wide circle of patients, colleagues, and friends. He had the vitality of a man much younger than the years he carried so easily on his equable shoulders, and to the very end of a long professional life he kept up a keen intellectual interest in medical science. He was always proud of his family connexion with Lord Nelson, after whom he was named. He leaves a widow, two sons, and three daughters.

Dr. HORACE LANCE FLINT, of Mansfield, Notts, died suddenly on March 27 while staying at Scarborough. He was born in that town 63 years ago, where his father was in practice. Before taking up medicine he served as an apprentice engineer. After graduating at Leeds with honours in 1909 and doing several hospital appointments he joined a leading practice in Mansfield. He served his country from 1915 to 1918 in Egypt and France. He returned wounded, and later had the opportunity of working under Sir Thomas Lewis, gaining much experience in cardiology, holding an appointment later in the heart centre at the General Infirmary at Leeds. He obtained his M.D. and published a book entitled *The Heart—Old and New Views*, in the preparation of which he received much encouragement from Sir William Osler. On returning to practice in 1919 he was the first physician in Nottinghamshire to own an electrocardiograph, and was frequently called in in consultation in the county. Considerable interest was aroused in the town when a hunter owned by one of the Royal Family arrived at his house to be electrocardiographed (the first time this had been done on a horse); it was found to be suffering from complete heart-block and had to be destroyed. Dr. Flint served for many years as physician on the staff of the Mansfield General Hospital. In 1937 he had an attack of coronary thrombosis; after many weeks' rest he resumed his full professional duties, but was obliged to forgo activities in recreation which he loved so well. The war years with the extra burdens they imposed increased the frequency of his attacks of angina. Last June he was obliged to give up work which was his life's interest, and had scarcely resigned himself to a life of inaction when he had his fatal attack. Dr. Flint combined the happiest qualities of the family doctor with a special knowledge of a particular branch of medicine, one of the best methods of ensuring a broad outlook on a specialty, and in the changes overtaking medical service, an example which, it is hoped, will often be followed. He leaves a wife, a married daughter, and two sons, one of whom is qualified in medicine.

Dr. WILLIAM B. MARTIN died at Old Colwyn, North Wales, on Easter Sunday, 1945. He was born at Cork, Ireland, on Oct. 21, 1882, being the eldest son of the late Lieut.-Col. John Martin, R.A.M.C. He received his medical education at Owen's College, Manchester, obtaining the English conjoint qualification

in 1907 and the D.P.H. about a year later. After some time in private practice he contracted phthisis in 1912, from which he made a good recovery at Nordrach-on-Mendip Sanatorium, remaining there as assistant for about a year. After holding appointments at other sanatoria he became district tuberculosis officer to the Kent County Council in 1918, which post he held until 1937, when he had to resign owing to ill-health. He published several papers on tuberculosis, and, in spite of ill-health, retained his interest in this subject until the end. The numerous letters received testify to the esteem and affection felt towards him by his patients and those with whom he worked. He was a member of the B.M.A. since 1911.

Dr. THOMAS MARLIN, of Portland Place, London, who died at Bushey Heath, Herts, on April 5, was the son of David Marlin, of Butterburn Park, Hamilton. He studied medicine at the University of Glasgow, at University College Hospital, and at St. Bartholomew's Hospital, and graduated M.B., Ch.B.Glas. in 1909. He proceeded M.D. (with commendation) in 1912, obtained the D.P.H. in 1915 and the D.M.R.E.Camb. in 1920. His early appointments were those of house-surgeon at the Miller General Hospital and house-physician at the City of London Hospital for Diseases of the Chest. Later he was for a time medical officer in charge of the massage, electrotherapeutic, and light department at University College Hospital. He served during the last war as officer in charge of the massage department of No. 5 Orthopaedic Convalescent Camp, Salonika, and of the Special Military Surgical Hospital at Edmonton. In recent years Dr. Marlin had been physician in charge of the department for manipulative treatment and physiotherapy at the Hampstead General Hospital and was also honorary medical officer to the British Boxing Board of Control. He published in these columns a paper on "Some Common Complaints amenable to Spinal Treatment," and wrote a book in 1934, *Manipulative Treatment for the Medical Practitioner*. He joined the B.M.A. in 1915 and held office as vice-president of the Section of Radiology and Physiotherapeutics at the Annual Meeting at Cardiff in 1928.

Dr. GEORGE MACKIE, of Wellington, Shropshire, died on April 10 at the age of 75. His father was a doctor in Inch. He was educated at Aberdeen University, and had been in practice at Wellington for nearly half a century, retiring only last year on account of failing health. He was a very popular figure in B.M.A. circles, both local and central, having been Representative of the Shropshire and Mid-Wales Branch 1919–34, again in 1936–9, and finally in 1941. He was a member of the Rural Practitioners' Subcommittee, 1925–30. At the Annual Meetings of the Association he was a regular and welcome figure, and will be remembered as one of the most joyous participants in the visit which the Association made to Canada in 1930 and on the world tour in 1935. He had been president of his Branch and was for many years chairman of the Shropshire Panel Committee. Mackie took an active part in everything which affected the interests of Wellington. It was largely owing to his efforts that the local cottage hospital came into being; he was very active on the St. John Ambulance Brigade; in the last war he was mobilized in the Territorial Force as a major, having been associated with the Volunteer movement from his earliest days in Shropshire. He was greatly interested in music and was president of the Wellington Orchestral and Operatic Society. In short, Mackie was a fine example of the good general practitioner who threw himself into every movement likely to advance the interests of his adopted home. A local colleague writes, "He was a man with a kindly heart, always ready to help and to look with compassion on the failings of another, but, above all, always able to smooth a difficulty with that rare gift he possessed in such abundance—a keen sense of humour." This appreciation will be shared by all who knew him, and their sympathy will go out to his wife.—A. C.

The medical profession, particularly in West Derbyshire, has lost a distinguished member in the person of Dr. WALTER PHILLIPS, of Matlock, who died suddenly on April 19. Born in Damascus in 1878, the son of the Rev. John Phillips, of the Irish Presbyterian Mission there, it was natural that these early influences should have a profound bearing on his later career. On the return of his parents to Belfast he entered the Royal Academical Institution there and later Trent College. Thence he passed on to Queen's College, Belfast, and graduated B.A. in 1898. His medical training was taken at Queen's and at the Middlesex and London Hospitals. He qualified M.B., Ch.B., B.A.O. in 1902, and immediately joined the B.M.A. After house appointments at the Belfast Royal Victoria and London Hospitals he followed in his father's footsteps to become a medical missionary of the same Church, and so began an arduous and distinguished career in China. His period of service there was interrupted only by a visit to England in 1912 to take his F.R.C.S., and on his return to the East he became surgeon to the General Hospital at Newchang and also port medical officer. His steady conscientious work did not pass unnoticed, and for his services during various plague epidemics he was honoured by the Chinese Government. On the outbreak of the Japanese "incident" in North China he returned home and carried on a busy general practice. He is survived by his wife, a son, and a daughter, the son being in the I.M.S. and the daughter in the W.A.A.F. W. H. M. writes: Very shy and reserved, it was not easy for one to get to know him, but once one had penetrated this barrier one found a true friend. His knowledge of medicine was not circumscribed, and he kept abreast of modern developments. Dr. Phillips found little time to contribute to medical journals, but he had literary talents of no mean order, and he wrote several short stories and novels which were much enjoyed by a small circle of friends but which his innate reserve would not allow to be published. He made an excellent conversationalist, and his wide travelling abroad made him an excellent linguist. Apart from his literary efforts, his hobbies were carpentry and the serious study of Nature on the quiet lonely moors near his home.

Dr. JAMES WHITELAW ALEXANDER, who died on April 24, was born in Glasgow in 1863, the son of Dr. Thomas Alexander. Educated at Glasgow University and Anderson College, he qualified L.R.C.P.&S. in 1886. He went to sea as surgeon in the British and Burmese Steam Navigation Co., which he eventually left to go to the West Riding Mental Hospital, Wakefield. Later he was at Rainhill Mental Hospital, where he became assistant medical officer. He took his M.R.C.P.Ed. in 1894. Then he settled in Armley, Leeds, as assistant to Dr. Coleman, whom he succeeded in practice. While in general practice he took the M.D.Durham. For many years he held the appointment as medical officer to St. Mary's Infirmary in Armley. He later gave up the practice but continued as medical officer to St. Mary's until he finally retired in 1933 and went to live in Scarborough, where he died. Running parallel with his busy life, he made the Army his hobby, starting in the early Volunteer days up to the formation of the Leeds Rifles of the West Yorkshire Regt. (T.A.). He held the Territorial Decoration. He trained and went to France with the 8th Battalion Leeds Rifles, which he commanded until being invalided home in 1917. He was awarded the D.S.O. and was twice mentioned in dispatches. Later he was transferred to the R.A.M.C. and posted Administrator to the Sunderland War Hospital, which appointment he held until the end of hostilities. He was retired with the rank of brevet colonel. He returned to Leeds and rebuilt the remains of the practice in Armley. Dr. Alexander was a great reader and was the proud owner of a very fine library, every book of which he had read, and from many of which he could quote with almost uncanny accuracy. He was buried in Scarborough with military honours. He leaves a widow and one son, Dr. Neil W. Alexander. A correspondent writes: He never wasted a minute in a very busy life as a doctor and soldier, and he was loved by all those whom he served in practice and by all those who served him in the Army. I think he had only two enemies—the Hun and the patient at Rainhill Mental Hospital who felled him with a crowbar when off his guard. I only regret he never lived to see the final defeat of his first enemy. He was a great clinician and a fine soldier.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

At a Congregation held on April 27 the following medical degrees were conferred by proxy:

M.B., B.CHIR.—P. B. S. Cooper, J. J. Fleminger, R. J. Harrison, M. B. McIlroy

UNIVERSITY OF EDINBURGH

At a graduation ceremony, to be held on June 22, the Hon. LL.D. will be conferred on Lieut.-Gen. Sir Alexander Hood, K.C.B., C.B.E., F.R.C.P., Director-General, Army Medical Services; also on Prof. Frédéric Joliot and Madame Irène Joliot-Curie, joint Nobel prize-winners, for their work on the induced radio-activity of common elements.

UNIVERSITY OF DUBLIN

The fourteenth John Mallet Purser Lecture will be delivered by Prof. B. A. McSwiney, Sc.D., M.B., F.R.S., dean and professor of physiology, St. Thomas's Hospital Medical School, in the physiology theatre of the School of Physic, Trinity College, on Wednesday, May 16, at 4.30 p.m. The subject is "Visceral Sensation."

The Services

Major-Gen. O. Ievers, C.B., D.S.O., retired pay, has been appointed Colonel Commandant of the R.A.M.C., in succession to Major-Gen. W. H. S. Nickerson, V.C., C.B., C.M.G., retired pay, who has attained the age limit for the appointment.

Surg. Lieut.-Cmdr. J. E. Hughes and Surg. Lieuts. J. H. Begg and G. L. Grove, R.A.N.R., have been mentioned in dispatches for gallantry, skill, and devotion to duty while serving in certain of H.M. Australian ships in the successful assault operations on the Lingayen Gulf, Luzon Island.

Capt. J. D. Fisher, R.A.M.C., has been awarded the M.C. in recognition of gallant and distinguished services in North-West Europe.

Liberated.—Major W. R. Henderson and Capt. P. E. R. Tattersall, R.A.M.C.

Repatriated.—Surg. Cmdr. W. Greaves, R.N.

CASUALTIES IN THE MEDICAL SERVICES

Killed in action at sea.—Capt. James Arthur Perkins, R.A.M.C.

Missing, presumed killed.—Temp. Surg. Lieut. Alexander Grahame Moray Wilson, R.N.V.R.

Wounded.—War Subs. Capts. P. Delap, K. G. Green, and C. W. Mearns, R.A.M.C.

Wounded or injured.—Temp. Surg. Lieut. G. Smith, R.N.V.R.

Fl. Lieut. SYDNEY WETHERELL, who was killed by enemy action on April 8, was born in October, 1911. He studied medicine at Guy's Hospital and qualified L.M.S.S.A. After holding appointments as assistant in general practice he was commissioned as flying officer in the Medical Branch of the R.A.F.V.R. on Dec. 5, 1941. At the date of his death he was medical officer to a Royal Air Force squadron over-seas.

Squad. Ldr. GEORGE FORBES REES-JONES, R.A.F.V.R., died on April 18, when serving as radiologist at a Royal Air Force general hospital over-seas. He was born in 1908, studied medicine at Glasgow University and University College Hospital, London, and qualified M.R.C.S., L.R.C.P. in 1931. Before being embodied for war service he obtained the D.M.R.E.

DEATHS IN THE SERVICES

Major-Gen. Sir CHARLES MACWATT, C.I.E., I.M.S.(ret.), died after a very short illness on April 14 at the age of 80. He had a long and distinguished career culminating in his appointment to be Director-General of the Indian Medical Service from 1922 to 1926. He received his medical education at Edinburgh University, where he graduated M.B., C.M. in 1886 and in 1897 passed the B.Sc. in Public Health. In 1911 he obtained the F.R.C.S.Eng. and in 1925 was elected F.R.C.P.Ed. He entered the I.M.S. in 1887 and saw much service on the frontiers of India at Hazara in 1888, Lushai 1889, and in the second Miranzai and Hazara expeditions in 1891, and received the Frontier medal with clasps. He rose steadily and reached the administrative grade as Inspector-General of Civil Hospitals in 1918, having already received the C.I.E. in 1916, and he had also been awarded the Kaisar-i-Hind Medal, first class. His sound administrative work in the Punjab led to his selection as head of the I.M.S. in 1922 with the rank of major-general, and in 1925 he was knighted, having also been appointed Honorary Surgeon to His Majesty King George V. On his retirement in 1926 Sir Charles MacWatt continued to live in India for some years and was adviser on medical and sanitary matters to his friend the late General Sir Ganga Singh, Maharaja of the Bikanir State. His high medical qualifications and sound careful administrative abilities were the foundation of his highly successful career. By his first wife, Blanche Mathilde, daughter of the late Lieut.-Gen. S. F. Blyth, C.B., he had two sons; he married again last year. He was a member of the British Medical Association for 47 years, and in 1891 contributed a paper to the *British Medical Journal* on gunshot wounds of lungs.

Major-Gen. HENRY CHARLES RUPERT HIME, late A.M.S., died on April 24. He was born on Nov. 8, 1877, son of T. W. Hime, M.D., and studied medicine at Leeds, graduating M.B., Ch.B. of Victoria University, with honours, in 1899, and taking the D.P.H. in 1908. He served as an officer of the R.A.M.C. in the South African War 1899–1902 and again in the war of 1914–18. He received the D.S.O. in 1917 and was created C.B. in 1934 when he retired from the A.M.S.; he was also awarded the Belgian Croix de Guerre for his services in the last war. Joining the B.M.A. in 1902 he held office as president of the Egyptian Branch in 1928–9. General Hime was Honorary Physician to the King in 1932–4. After retirement he lived at Bemerton, near Salisbury.

Medical Notes in Parliament

National Health Service Negotiations

In the House of Commons on April 19 Mr. LIPSON asked the Minister of Health if he would issue a White Paper on the new proposals for a national health service which he had put before the British Medical Association and which they had circulated to their members, so that members of the House and the public might also have an opportunity to consider the Government's revised scheme. Mr. WILLINK said he had made it clear that there was as yet neither any revised scheme put forward by the Government on this subject nor any proposals of which publication in a White Paper or otherwise would be appropriate. Mr. LIPSON asked if the Minister did not agree that he had informed the B.M.A. that if these new proposals were acceptable to their members he was prepared to recommend their acceptance by the Government, and was he treating the House fairly when the B.M.A. had circulated these proposals not only to their 70,000 members but to the public. Mr. WILLINK replied that he had made his position clear in the answers given the previous week.

Mr. ANEURIN BEVAN asked when the Minister proposed to tell the House what were the proposals he had discussed with the B.M.A. Mr. WILLINK said there were as yet no proposals.

Dr. SUMMERSKILL said Mr. Willink knew he had put these proposals to the profession and had undertaken, if they commended them, to sponsor them to the Cabinet. Mr. WILLINK answered that if Dr. Summerskill desired to challenge every statement he had made he could not deal with the matter further.

Lady ASTOR: Is it not true that this body is a trade union, like any other?

Sir WALDRON SMITHERS asked the Minister whether, in view of the divergence of opinion about the proposals in the health White Paper and in view of the fact that many doctors, nurses, and patients were on active service, he would postpone the introduction of the Bill based on the health White Paper until after the General Election. Mr. WILLINK replied that he was not prepared to give any undertaking to that effect.

Mr. MCNEIL: Are we to understand, from the answer, that the Minister intends to introduce a Bill based on the White Paper before the General Election?

Dr. EDITH SUMMERSKILL: The original White Paper?

Mr. WILLINK: I cannot say the date, and I cannot say what the eventual form of the Government's proposals will be.

Penicillin Supplies

On April 19 Col. LYONS asked to what extent penicillin was now procurable at the direction of a medical practitioner, and what facilities existed for its immediate availability when prescribed. Mr. WILLINK replied that the scheme for the wider distribution of penicillin was in operation. Supplies of penicillin had been issued through the distributing centres to nearly all the larger hospitals in the country and could be obtained, on request, by any hospital which had a suitable case. Supplies did not yet permit of the unrestricted distribution of penicillin through chemists and the usual trade channels. A practitioner who requires penicillin for a patient must therefore obtain it from a hospital and not through the issue of a prescription to the patient.

Research into Pneumoconiosis

On April 24 Mr. J. GRIFFITHS asked the Minister of Fuel and Power if he had any statement to make about the efforts to combat pneumoconiosis among coal-miners. Major LLOYD GEORGE said that, following the report of the advisory committee on pneumoconiosis, arrangements had been made between his Ministry and the Medical Research Council for further investigations into the cause, prevention, and treatment of pneumoconiosis. The Council, in conjunction with his Ministry, had undertaken to establish and maintain a research centre in South Wales, and had appointed Dr. C. M. Fletcher to direct the work. He would take up his duties on June 1 next, and it was hoped to provide a small number of beds at a selected hospital. Additional physical and chemical investigations and reports would be made by inspectors of mines and other members of the Ministry staff. A joint committee of the Ministry and the Council had been appointed to assist in the development and co-ordination of the whole scheme of research.

Figures were not available of the number of workers lost to the industry by reason of silicosis and pneumoconiosis. He was informed that the number of new cases of silicosis and pneumoconiosis certified by the Silicosis Medical Board for

total disablement and suspension from the industry on account of these diseases between Jan. 1, 1939, and March 31, 1945, was 6,483, and that during that period 647 death certificates were also issued by the Board. These figures included a relatively small number of surface workers certified under the Coal-mining Industry (Pneumoconiosis) Scheme, 1943.

Food Supply for Norway

Answering Mr. Harvey on April 20 Mr. G. HALL said the food situation in Norway was serious, though not catastrophic. It was not nearly so bad as in Holland or as it was in Greece just before the liberation. There appeared to be no widespread starvation among Norwegian children. Much of the relief provided by Sweden had been earmarked for children. Supplies of foodstuffs were being sent forward from Sweden as well as drugs and surgical instruments. Very considerable quantities of medical supplies were also being sent by the American Red Cross. Supplies from Sweden to Norway were not generally sent under the auspices of the International Red Cross, but to a body in Oslo called the Swedish Donors' Representatives, who distributed them through various charitable organizations, schools, and children's institutions. A delegate of the International Red Cross reported that the arrangements made by the body in Oslo ensured a wise and judicious use of the relief supplies.

Wheat Germ for "Medicinal Purposes"

On April 24 Sir E. GRAHAM-LITTLE asked the Minister of Health on what principle his Department advised allocation of wheat germ for the production of certain patent foods and medicines by a few favoured firms; what was the source of the wheat germ thus used; and what proportion that allocation bore to the available supply of wheat germ in this country. Mr. WILLINK said that the principle on which his Department advised was that any preparation for which wheat germ was allocated should be of such a composition that it was of value for medicinal purposes, and that it should be made available for such purposes.

The National Flour

On April 25 Mr. STOKES asked the Minister of Food on what date the standing committee on medical and nutritional problems made its recommendation with regard to the reduction of the extraction rate of wheat from 85 to 80%; and on what date the advice of the committee was specifically sought on this question.

Mr. TOM WILLIAMS: I understand that the committee was asked for advice on May 8, 1944, and that it submitted its report on July 27, 1944.

National Dental Service

Sir E. GRAHAM-LITTLE asked on April 26 whether Mr. Willink was aware that a statement of his proposals regarding a national dental service, promised by April 14, had not been circulated to the profession.

Mr. WILLINK said he understood that the profession's representatives began a few days ago the circulation of a report to those whom they represented of various matters which they had discussed with him. He wished, if possible, to know the profession's views on these matters before the Government considered what proposals they would make to the House on dentistry in the new service. He would keep in touch with the profession as to the best means of achieving this.

Medical Board for Pneumoconiosis

Dr. SUMMERSKILL reported on April 26 that a large number of workers suffering from pneumoconiosis awaited examination. She asked what action was being taken to expedite this. Mr. PEAT answered that Sir William Jowitt, in company with Major Lloyd George, had discussed this matter with the miners' representatives. With the assistance of the Minister of Health it had been possible to obtain the services of a few more doctors on the medical boards. Other special arrangements had been made with a view to expediting the examination of the applicants. The primary need was to get additional doctors with the necessary experience for this work. This was a matter of great difficulty at present.

Mr. OLIVER asked on the same day whether Sir William Jowitt knew of the anxiety felt by workers in industries which exposed them to the inhalation of silica, asbestos, and other dust when these men had contracted pneumoconiosis, and that no provision had been made to include them in the Workmen's Compensation Act. Mr. PEAT replied that the Minister would be prepared to consider some suitable extension of the compensation schemes for pneumoconiosis when an adequate number of doctors qualified to carry out the necessary medical examinations were available. Operation of the existing schemes was being severely hampered by the shortage of doctors. Sir William therefore could not contemplate extending them at present.

Admission of Medical Students

Mr. WILLINK on April 26 told Mr. Lipson that the average number of medical students accepted at the teaching hospitals for the three years before the war was 1,462. The number of admissions for the session to begin next autumn was not known. The medical schools would not complete the selection of candidates till later in the year. The average figure for the three years before the war included 226 women. Admissions for the present academic year were also 1,462, including 374 women. The numbers in medical schools could not be readily increased. There was great difficulty in obtaining staff, but the Ministry was doing all it could.

Mr. LIPSON asked the Minister to consider making use of public hospitals to give training to would-be women medical students who had been refused admission to teaching hospitals this autumn.

Mr. WILLINK replied that this was being considered.

Education in Scotland

Mr. JOHNSTON moved the second reading of the Education (Scotland) Bill in the House of Commons on May 1. He said that the object of the Bill was to bridge certain gaps in the Scottish educational system. It was a denial that education either began at 5 or ended at 14 years of age. This was a machinery Bill, providing for nursery schools, primary schools, compulsory secondary education up to 16, and after-school education. There would be certain ancillary services and free transport to and from school or college. There would be a medical inspection at the junior colleges, and free medical treatment, including the provision of spectacles. Scholarships, bursaries, and other allowances might be paid to persons over school age; this would cover students at universities and central institutions.

The Bill was read a second time.

Food of British P.O.W.s

On May 1 Sir JAMES GRIGG answered a series of questions regarding the rations supplied to and the treatment of British prisoners of war in camps in Germany. He said that all ex-prisoners on reaching this country completed a questionary which enabled them to give information about the treatment they had received. They were returning in large numbers daily, and it would not be possible to collate the information derived from their reports for some time. Numerous representations had had to be made to the Germans during the course of the war about breaches of one or other of the articles of the Geneva Convention. He gave particulars of the food given to our prisoners by the Germans in a reply on March 2. Information received recently suggested that even these rations had been reduced since then. Owing to the disintegration of the German administration and transport system during recent weeks, and the large-scale compulsory transfers of our prisoners of war, it was impossible to make any statement of general application at present.

Casein Hydrolysate for Starving Children

On May 1 Sir JAMES GRIGG informed Mr. Parker that he was aware that casein hydrolysate was used with success in Calcutta during the recent famine to revive moribund individuals and restore them to health; and that attempts were now being made to supply it to the inmates of concentration camps in Germany and to Dutch civilians, both in the standard form and in a form suitable for intravenous injection for cases *in extremis*.

Civilian War Casualties

Mr. HERBERT MORRISON states that from the outbreak of the war to date the civilians killed or injured by enemy action in the United Kingdom numbered 146,760. Killed or missing believed killed, were 60,585, including 26,920 men, 25,39[illegible] women, 7,736 children under 16, and 537 unclassified. Persons injured and detained in hospital numbered 86,175, including 40,736 men, 37,816 women, and 7,623 children under 16. In the London regional district the casualties were 80,507.

Medical Relief for Channel Islands

The Red Cross relief ship *Vega*, in her fourth voyage to the Channel Islands lately, carried medical and surgical supplies. Two doctors of neutral nationality, who will act as a medical commission to select sick persons for evacuation, travelled on this fourth voyage and should by now have started on their task. On her third voyage the *Vega* carried 1 ton of *x*-ray film, a consignment of hearing aids for the deaf, one consignment

miscellaneous medical supplies, and 1,400 litres of petrol for doctors' cars and ambulances. On her second voyage she carried 20 tons of mixed medical supplies and a small consignment of anaesthetics; on her first voyage 37 cwt. of mixed medical and surgical supplies.

Medical Examination before Oversea Service.—On April 10 Mr. JAMES GRIFFITHS asked the Secretary of State for War whether men of 40 years of age and over were subject to a special medical examination to ascertain their fitness for the conditions prevailing in the Far East before being drafted for service in that theatre of operations. Sir JAMES GRIGG said that no special medical examination was given to such men. The normal examination of all men posted over-seas, which naturally took their age into account, was designed to ensure that no one was sent abroad who was not medically fit for the duties he would be called on to perform.

Mass Radiography.—Mr. WILLINK said on April 19 that the number of mass radiography units that could be manufactured was still limited, nor was it possible at present to make available more than a proportion of the medical specialists needed to operate the system. It was not yet practicable to extend mass radiography facilities to the East Riding of Yorkshire.

Incidence of Tuberculosis.—Mr. JACKSON on April 19 asked the Minister of Health to institute inquiries into the increased incidence of tuberculosis as billeting young children and placing young children with elderly people who had the disease might be the cause of the increase. Mr. WILLINK said no special inquiry was needed, nor should the trend of tuberculosis be judged from incidence rates alone. In fact the number of deaths from tuberculosis was no higher to-day than before the war. The danger to which Mr. Jackson referred was recognized, and great care in billeting children was exercised by local authorities while evacuation was in progress.

Hospital at Dar-Es-Salaam.—Col. LYONS on April 25 asked about the insufficiency of accommodation and the inadequate and obsolete equipment at the European hospital at Dar-Es-Salaam and the high incidence of malaria contracted by patients therein; what report was made by a commission of inquiry upon the matter; and what steps were proposed. Mr. EMRYS-EVANS answered that as the result of the report of the committee referred to, which found the state of the hospital to be unsatisfactory, expenditure of £74,000 had been approved for the extension and improvement of the hospital buildings. Large orders for modern equipment have been placed in this country by the Tanganyika Government. These orders would be met as rapidly as possible.

Christian Science Nurses.—Dr. SUMMERSKILL asked on April 26 why certain individuals attached to the Christian Science movement had been permitted to call themselves nurses in view of the recent Act which limited the description "nurse" to those suitably qualified. Mr. WILLINK said he had not yet brought into operation the provisions of Subsection (1) of Section 6 of the Nurses Act, 1943, which would restrict the use of the title "nurse," or made regulations under proviso (*b*) to that subsection. When he did so it was his intention to require Christian Science nurses to describe themselves as "Christian Science nurses." An assurance on the matter had been given by his predecessor, and the House of Commons, in the Public Health Act, 1936, had given statutory recognition to Christian Science nursing homes. He thought the object of the Act would be sufficiently met by a provision that Christian Science nurses should be required so to describe themselves. There had been difficulty in bringing the regulations into operation, particularly from an omission in the drafting of the Act. He hoped to make the regulations at an early date.

Notes in Brief

Mr. Johnston has appointed a Scottish Committee of Inquiry into the provision made for children deprived of a normal home life. The committee includes Dr. Nora I. Wattie.

By 273 to 74 the House of Commons on April 17 refused to allow Dr. R. D. McIntyre to take his seat as member for Motherwell without being introduced by two sponsors. On the following day Dr. McIntyre appeared with two sponsors, affirmed and took his seat.

Mr. Willink is consulting his Medical Advisory Committee about future arrangements for the diagnosis and treatment of rheumatic diseases, with which spas are specially concerned. He says it would be premature to make any pronouncement on the subject at present.

Having regard to the substantial proportion of those entitled to vote who are serving in the armed Forces, elections to the Dental Board for some time to come would, Mr. Attlee states, not only involve great practical difficulties but inadequately reflect the views of the electorate.

There appear to be no fewer than 26 classes into which patients in E.M.S. hospitals can be grouped for the purpose of recording adequately at any time the number of Ministry of Health patients and the number of other cases, the total in-patient days, total out-patient attendances, and the number of *x*-ray examinations. This sounds formidable, especially to the non-administrator, but hospitals will be helped by the booklet *Emergency Hospital Scheme: Classification of Patients* published by the County Accountants' Society. The latest (3rd) edition is now available, price 2s. 6d., from the secretary of the society at County Hall, Chichester.

Medical News

The British Council has arranged the following lectures for doctors of the Dominions and U.S. Forces and members of the B.M.A. in Birmingham, to be held at the University Overseas Club: May 13, "The Problems of Peptic Ulcer; The Present Position as seen by a Physician," Dr. T. L. Hardy. June 3, "Cancer: Some Theoretical Considerations," Mr. Hugh Donovan. June 17, "Fat Embolism," Prof. A. C. Frazer.

A meeting of the London Association of the Medical Women's Federation will be held at B.M.A. House (Tavistock Square, W.C.) on Wednesday, May 16, at 8 p.m., when Lieut.-Col. Albertine Winner, R.A.M.C., will speak on "Social Medicine and the Women's Services in the Armies of Britain, Canada, and the U.S.A." Surg. Lieut.-Cmdr. Rewcastle, R.N.V.R., and Wing-Cmdr. Butler-Jones, R.A.F., will open the discussion. Medical men and women guests are invited.

The following meetings of the British Institute of Radiology will be held at 32, Welbeck Street, W.: Thursday, May 17, 7.30 p.m., annual general meeting, followed by ordinary meeting and presidential address by Dr. E. Rohan Williams, "The Planning of the Diagnostic Radiological Department in a Large General or Teaching Hospital"; Friday, May 18, 4 p.m., Dr. J. F. Brailsford, "Malignant Diseases of Bone"; 5 p.m., informal meeting of medical members to show interesting cases.

A meeting of the Eugenics Society will be held at the rooms of the Royal Society, Burlington House, Piccadilly, W., on Tuesday, May 29, at 5 p.m. Mr. Cyril Bibby will give an address on "Sex Education—Aims, Possibilities, and Plans."

The next quarterly meeting of the Royal Medico-Psychological Association will be held at Birmingham City Council House, Victoria Square, Birmingham, on Thursday, May 31, at 10.15 a.m., when papers will be read by Dr. Alfred Meyer and Dr. F. A. Pickworth on "Neuropathological Problems arising from Leucotomy" and "The Physiology and Pathogenesis of Amnesia" respectively. At 2.15 p.m. the retiring president will deliver his valedictory address entitled, "Some Observations on the Reduction of the Distinctions drawn between Mental Ill-health and Physical Ill-health."

A reception was held on April 17 at the Society for Visiting Scientists, 5, Old Burlington Street, London, W., for the Belgian professors on a fortnight's visit to this country as guests of the British Council. Among those present were: Profs. M. F. L. de Hemptinne and C. J. Jungers, Faculty of Science, Louvain; N. Goormachtigh and P. Govaerts, Faculty of Medicine, Ghent; V. Bohet, Professor of English, Liége; and P. T. Lambrechts, Faculty of Philosophy and Literature, Liége.

At the quarterly meeting of the Central Council for Health Education held at B.M.A. House, London, on April 19, the chairman, Dr. Arthur Massey, announced that Lord Woolton, Minister of Reconstruction, had accepted the invitation extended to him on behalf of the council by the Minister of Health to succeed the late Dr. Temple, Archbishop of Canterbury, as its president.

The American College of Chest Physicians has cancelled its annual meeting which was to have been held at Philadelphia in June.

In the course of a single day's session a mobile team operating from the Ministry of Health's blood transfusion centre at Leeds recently collected blood from 820 donors, all of whom were Service personnel at a military unit. This is the highest number of donors ever dealt with by one team during one working day. The team consisted of one medical officer, assisted by 12 nurses, a blood-grouping technician, and a clerk, and worked from 8 a.m. to 4.30 p.m. The next day the blood collected by the team was flown to the B.L.A. in Western Europe.

The following medical men have been adopted as Labour candidates for Parliament: Lieut.-Col. Leonard F. Browne, R.A.M.C., for the Penrith and Cockermouth Division of Cumberland; Dr. Stephen Taylor for the new Barnet constituency; and Squad. Ldr. S. Segal, R.A.F.M.S., for Preston.

At the request of the Netherlands Government, the Bernhard Baron Research Professor in the Royal College of Surgeons of England, Prof. John Beattie, is at present serving on the Advisory Committee of S.H.A.E.F. Netherlands Mission which is advising that Government on the measures necessary for the relief of famine conditions in Northern Netherland. Prof. Beattie has charge of the laboratory and chemical investigations and has been chosen because he has developed and tested in the College laboratories various forms of treatment for extreme cases. He has with him in Holland members of the technical staff of the College who are training Dutch technicians in the up-to-date technical procedures required in this important work of famine relief.

As a precaution against mistakes in replacing gas cylinders on anaesthetic apparatus or in connecting a pipe-line to the apparatus—e.g., to a cylinder of nitrous oxide instead of a cylinder of oxygen—the Ministry of Health suggests in a circular to hospital and local authorities that a second person, preferably a doctor, should examine the connexions, making sure all is correct and in order, and record the fact that he has done so in a book kept for this purpose. It is greatly to be hoped that hospital authorities will follow this or some equally reliable procedure.

Dr. J. G. Treharne Thomas, *M.C.*, has been promoted to the post of medical superintendent of Cambridgeshire Mental Hospital, Fulbourn, nr. Cambridge.

The Universidad Central de Quito, Ecuador, has created a Chair of the History of Medicine with Dr. Virgilio Pasedes Borja as the first professor.

The March issue of the *Irish Journal of Medical Science* is a Rotunda Hospital bicentenary number.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* during the week the incidence of scarlet fever went up by 141 cases, of diphtheria by 127, and dysentery by 60, while notifications for measles fell by 4,441 cases, those for acute pneumonia by 91, and those for whooping-cough by 22.

The increase in diphtheria is the largest for two years. There were small rises in most areas: Lancashire had 27 more cases than last week, Yorks West Riding 25, and Northumberland 20. In York C.B. the cases rose from 9 to 27. Notifications of scarlet fever rose throughout the country except in the south-east and south-west. The only large fall in acute pneumonia was that of Yorks West Riding with 39 fewer cases than last week. Measles returns fell by the following amounts in individual counties: Yorks West Riding 687, Essex 495, Staffordshire 348, London 337, Middlesex 330; increases of the following amounts were also reported: Sussex 92, Cumberland 76, Southampton 60, Cornwall 47.

A general increase in incidence, rather than fresh outbreaks, was responsible for the breaking of last week's record total for dysentery. In London cases rose from 32 to 77 (St. Marylebone 41, Wandsworth 13). The other large returns were Lancashire 61, Yorks West Riding 37, Warwickshire 33, Staffordshire 29, Middlesex 26, Kent 23, Devon 23, Derbyshire 23, Essex 22, Gloucestershire 22, Oxford 16, Northumberland 14.

In *Scotland* the incidence of dysentery was 17 higher than last week, and of measles 43 higher. The largest returns for dysentery were: Glasgow 55, Edinburgh 30, Aberdeen 21, Inverness 10, Zetland County 19. The recent outbreak in the west end of Aberdeen, involving 252 cases, has been traced to a milk supply; no fatal cases were recorded.

In *Eire* a rise of 13 in the notifications of diphtheria, and 23 for whooping-cough, and a fall of 34 for measles were recorded. The rise in diphtheria was contributed by the outbreak in Leixlip, Co. Kildare, and by Lullymore Turf Camp.

In *Northern Ireland* notifications of scarlet fever fell by 26 cases and of diphtheria by 8.

Quarterly Returns for Northern Ireland

During the December quarter the births registered were equivalent to a rate of 22.7 per 1,000, this being 3.0 above the average of the five preceding fourth quarters. The infant mortality was 68 per 1,000 registered births, and 6 below the five-years average for the December quarter. Maternal mortality was 2.3 per 1,000 births, and 1.1 below the average. The general death rate was 12.5 per 1,000, this being 1.5 below the rate for the corresponding quarter of 1943, and 0.4 below the five-years average. Deaths from pulmonary tuberculosis and other forms of tuberculosis numbered 201 and 62, the former being the same as and the latter 2 in excess of the five-years average.

The provisional returns for the year show that the death rate during 1944, 12.8 per 1,000, was the lowest ever recorded in Northern Ireland. The infant mortality, 67 per 1,000 registered births, was also the lowest on record, and was 10 below the average of the five preceding years. The birth rate, 23.5 per 1,000, decreased by 0.7, but was 2.1 above the five-years average.

Week Ending April 28

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,426, whooping-cough, 1,190, diphtheria 564, measles 16,023, acute pneumonia 530, cerebrospinal fever 56, dysentery 486, paratyphoid 3, typhoid 3. One case of typhus fever was imported into the country.

No. 16

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended April 21

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1945 (a)	(b)	(c)	(d)	(e)	1944 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	73	2	23	4	4	75	3	32	5	3
Deaths		1	—				—	2		
Diphtheria	565	19	108	113	14	622	31	166	105	28
Deaths	7	1	2	—	—	15	—	2	1	1
Dysentery	523	77	197	4	—	204	33	95	3	—
Deaths				—	—				—	—
Encephalitis lethargica, acute	3	—	—	—	—	2	—	1	—	—
Deaths		—					—			
Erysipelas			23	7	3			54	10	5
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				22					11	
Deaths	47	5	9	8	1	46	15	25	6	
Measles*	15,901	1314	437	52	34	2,784	283	632	263	1
Deaths	13	2	3	—	—	—	—	—	3	—
Ophthalmia neonatorum	68	6	15	—	—	69	3	14	2	—
Deaths										
Paratyphoid fever	3	—	—	—	—	2	1	2(B)	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal†	573	23	5	2	3	829	63	4	9	
Deaths (from influenza)	11	1	—	1	—	18	2	2	2	—
Pneumonia, primary			191	33				220	30	
Deaths		29		12	9		34		8	1
Polio-encephalitis, acute	1	—				1	—			
Deaths		—					—			
Poliomyelitis, acute	8	1	1	—	1	5	—	1	1	—
Deaths		—					—			
Puerperal fever		4	19		—		—	14		—
Deaths										
Puerperal pyrexia‡	167	8	11	3	4	150	8	11	3	
Deaths		—					—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,356	51	192	22	36	1,607	103	189	18	7
Deaths	3	—	1	—	1	—	—	1	—	
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever	5	1	—	8	—	1	—	—	11	—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough*	1,212	66	181	56	24	2,321	221	178	47	2
Deaths	9	—	5	—	—	13	1	2	—	—
Deaths (0–1 year)	342	40	56	46	13	353	55	79	35	2
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	4,469	600	621	228	115	4,505	646	593	240	12
Annual death rate (per 1,000 persons living)			14·1	14·7	§			13·6	13·7	§
Live births	6,432	674	849	394	282	7,541	947	1027	489	29
Annual rate per 1,000 persons living			17·0	25·4	§			20·9	31·9	§
Stillbirths	199	14	38			239	26	35		
Rate per 1,000 total births (including stillborn)			43					33		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

‡ Includes puerperal fever for England and Wales and Eire.

§ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

Letters, Notes, and Answers

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ANY QUESTIONS?

Monckeberg's Senile Degeneration

Q.—*A lady aged 60, with blood pressure about 250/130 and symptoms of cardiac deficiency, suffers from attacks of severe pain in both calves, coming on only with walking. X-ray films reveal slight calcification of the tibial arteries. Nicotinic acid upsets her. Would sympathectomy help?*

A.—This patient is suffering from Monckeberg's senile medial degeneration of the tibial arteries. The presence of calcification in the middle coats shows that the disease is well advanced, and there must certainly be a considerable degree of obliteration of the channels. It is not possible to do much at this stage of the disease. Sympathectomy would be of little use, and she is old for this. Great care must be taken of the feet to preserve the skin from injury. Papaverine is sometimes helpful in relieving the pain on walking.

Smoking and Hypertension

Q.—*In his article "The Antidiuretic Action of Nicotine"* (JOURNAL, *March 24, p. 403*), *Prof. J. H. Burn states that smoking raises the blood pressure. Would you kindly tell us if it definitely aggravates hypertension and should therefore be stopped?*

A.—An answer to a rather similar question was published in the *Journal* of June 10, 1944 (p. 801). The blood pressure has been observed to rise on the average about 20 mm. systolic and 15 mm. diastolic when a normal subject smokes two cigarettes, even though he is a habitual smoker. The pressure returns to normal within five to fifteen minutes. The rise is apparently due to peripheral vasoconstriction. No comparable data have been noted for the rise in blood pressure in hypertensive subjects on smoking. It is generally agreed, however, that tobacco smoking is *not* an aetiological factor in essential hypertension, and it is further stated that patients with chronic tobacco poisoning have a low blood pressure. There is, in fact, no evidence that smoking aggravates hypertension and no justification for stopping it in this disease. On the other hand, there is a great deal of evidence that the vasoconstrictor action of tobacco is harmful in effort syndrome, neurocirculatory asthenia, angina pectoris, Buerger's disease, and other disorders of the peripheral circulation, and that it should be stopped in these conditions. In theory it may also be harmful in wound shock if the blood supply to a limb is imperilled by arterial injury.

Giant Urticaria

Q.—*What is the most promising line of treatment for a case of giant urticaria, with irritating and crippling effusions into the feet and joints? Calcium has not helped. Are peptone injections likely to be of use?*

A.—Treatment of urticaria, and especially giant urticaria, is often unsatisfactory, as shown by the large number of different therapeutic procedures. The allergic theory provides for only a proportion of the cases, sensitiveness to food or focal infection being well-known examples. Common foods are not often causal factors, because of automatic desensitization to them: the scratch tests or passive transfer method of Prausnitz and Kuestner may help to solve the problem of the cause, but as in other allergic manifestations skin-testing never offers final evidence of aetiology. Elimination diets are more likely to be helpful. A psychological factor is so often present that a sedative mixture may be included. The investigation requires a detective's mind and application to seek out and possibly discover some unexpected internal or external determining agency. General measures should include treatment of the nervous system by rest, change of environment, or of work; and desensitization by non-specific procedures, such as intramuscular injection of peptone. Alternatively an acid mixture after meals, or peptone 7 grains one hour before meals. Adrenaline injections during the attack may be required, and, finally, focal infection should be treated if found.

Hunter's Test for Bile in Urine

Q.—*What is the technique for Hunter's test for bile in the urine (referred to in your recent annotation on the treatment of hepatitis —March 24, p. 415)?*

A.—The following description of Hunter's test is taken from the second edition of Dr. G. A. Harrison's *Chemical Methods in Clinical Medicine:* "In a centrifuge tube place 10 c.cm. of urine; if it is not acid, it must be made slightly so with acetic acid. Add 4 c.cm. of 10% barium chloride, mix, and mark the upper level of the fluid with a grease pencil. Centrifuge and decant completely. Add distilled water to the mark, mix thoroughly, centrifuge, and decant completely again. Stir the precipitate with 0.5 c.cm. of van den Bergh's diazo reagent by means of a capillary pipette of which the end has been sealed in the flame. Add 2 c.cm. of alcohol (absolute or 96%) and 0.3 c.cm. of 6% $Na_2HPO_4.12H_2O$. Mix and centrifuge. If bilirubin is present the supernatant fluid will be red, due to the formation of azobilirubin."

Vasomotor Instability

Q.—*A woman of 23 suffers from extreme vasomotor changes in the hands and feet, most marked in the fingers. In warm weather, or after exercise, piano-playing in particular, the hands become red, swollen, and painful. In cold weather she has a chilblain type of circulation. She has had all the recommended treatments, but they are of no avail. What can be done for her?*

A.—This is a most difficult problem in therapeutics, and success in treatment is uncertain. The patient evidently suffers both from the effects of vasodilatation which warmth induces in the digits and from vasoconstriction in response to cold. It is not at all clear that the degree of such changes is outside the limits of normal variation, and it is possible that the abnormal feature in the patient is her mental reaction to the variations in her circulation. It is suggested, therefore, that treatment along general lines with particular attention to the patient's personality and her orientation towards the circumstances of her life may prove the most satisfactory treatment. Neither vasodilator nor vasoconstrictor drugs nor surgical operation offer any rational or empiric therapeutic prospects in this condition.

Methods of B.S.R. Estimation

Q.—*There is much variation in the method of recording sedimentation rates (B.S.R. or E.S.R.). Is it legitimate to divide the results obtained by the 200-mm. Westergren method by 2 in order to obtain a percentage, so as to be comparable with other results expressed initially as percentages?*

A.—To divide the reading obtained from the Westergren method by 2 is not strictly correct in comparison with other methods. For practical purposes comparable results may be obtained providing the other methods calculate the percentage on the amount of plasma. For example, the figures given are from experimental results, the normal values showing the most divergence.

No.	Westergren Method; 200-mm. Tube. Plasma mm. (and mm. %)	Modified Zeckwer and Goodell Method; 10-cm. Tube. Plasma mm. %	Micro-method; 100-mm. Tube. Plasma mm. %
1	50 (25)	30	24
2	36 (18)	26	18
3	10 (5)	5	8
4	4 (2)	2	5

Trichomonas Infection

Q.—*What is the technique of "blueing" in resistant cases of trichomonas infections of the vagina? What strength of solution of gentian violet is used?*

A.—In resistant cases of trichomonas infestation, first the vagina should be irrigated or swabbed with a solution of sodium bicarbonate; it should then be dried and painted with a 1–2% aqueous solution of viola crystallina (gentian violet) or liquor tinctorum, which consists of crystal violet and brilliant green, 0.5% of each in equal parts of alcohol and water. The application may be made through a Cusco or Fergusson speculum according to the preference of the operator.

Unilateral Flush after Food

Q.—*A boy aged 2 years has since birth had a facial erythema almost immediately after beginning his meals. It persists for 1/2 to 3/4 hour after feeding and then clears. The part of the face affected is that extending from the temporal region downwards across the malar bone to the angle of the mouth—on the left side; it is about two inches wide and fairly well defined. What are the exact condition, aetiology, and treatment, if any?*

A.—This is a curious story, rather like the rare "jaw-winking" phenomenon in which a congenital ptosis is temporarily improved when the child opens the mouth. Jaw-winking is usually explained

as an atavistic regression to a condition present in fishes. It may be, in the present case, that the area described as affected corresponds to a "gill-opening." Essentially, the description is of an unusual vasomotor reflex action, and, provided there is no underlying naevus or naevoid condition, there is no treatment.

Radium for Rodent Ulcer

Q.—*I have recently had a rodent ulcer excised, and the base cauterized by the electric cautery. I have been told that the use of radium may cause cataract. Is this so? And if so, is there no method of using radium that will prevent such a contingency? The ulcer was near the left canthus, between the nose and the eye.*

A.—There is no danger of a cataract resulting from the proper use of radium for a rodent ulcer in the situation given. As a rule, the dose reaching the conjunctiva is insufficient to produce any conjunctival reaction, so that it is quite certain that the lens—where the dose is still smaller—will be uninjured.

Consent for Operation on Minors

Q.—*Is it legally necessary or desirable to obtain the parents' consent before doing in a minor a lumbar puncture under a local analgesic for diagnostic or therapeutic reasons (e.g., relieving intracranial pressure)? If it is necessary, it would seem that consent should previously be obtained for many minor operations—e.g., exploratory puncture of the chest, opening a quinzy, giving of intraperitoneal saline—even though no anaesthetic be used.*

A.—In strict law even the slightest physical interference with the person of another is an assault, for which damages can be awarded in a civil action or punishment in a criminal prosecution. Most kinds of physical interference which would otherwise be assaults may be justified by the consent of the person who suffers them, and among these justifiable forms of interference are medical and surgical procedures which are not in themselves unlawful. As a minor cannot give a legally valid consent, his parent or guardian must consent for him. Consent must, to be valid, be given freely and with substantial knowledge of the nature and purpose of the interference. The law knows also, however, an implied consent. By placing a minor in hospital, a parent doubtless gives an implied consent to his treatment by reasonable measures which carry no material risk to health or life. Where the medical adviser proposes to adopt a measure which involves drastic interference and carries risk, he owes the duty of first obtaining valid consent. As in so much of our law, the line between ordinary measures of treatment to which consent may be assumed, and drastic (not a legal adjective this, but one selected for convenience) treatment to which special consent ought to be asked, cannot be drawn in general terms. Its precise position in each situation is a question of fact, and in drawing it a court would consider such factors as the degree of pain, disturbance, or risk involved; or whether the particular act complained of was a usual part of the treatment of the particular illness, so that the person who had the right to consent or refuse might reasonably be held to have agreed to it by the act of bringing his child for treatment; and the like. The doctor should always bear in mind the need for consent to a class of procedures which may here be loosely but not inappropriately called "serious." If he asks himself whether he, in the parent's place, would prefer to be given the chance of refusing consent, he will probably not go far wrong.

Fatigue after Removal of Ovaries

Q.—*A patient aged 45 had a fibroid uterus and cystic ovaries removed eighteen months ago. She menstruated regularly until her operation, and her blood pressure, taken at the time, was 132/71. She now has "palpitation" and a tendency to fatigue. Her heart and pulse are normal. Her blood pressure is now 135/98. I propose to treat her with hexoestrol mg. 1 t.d.s. Will this have any effect on her blood pressure?*

A.—A patient who has had the uterus and both ovaries removed is likely to suffer from menopausal symptoms. These most commonly take the form of headaches, hot flushes, and emotional disturbances, though palpitations and a tendency to fatigue may also occur. Hexoestrol in the dosage mentioned is likely to relieve such symptoms and to give the patient a general sense of well-being, and—provided anaemia is excluded, and treated if necessary—this would seem to be the correct treatment in this case. The dosage should be gradually reduced as the symptoms improve. It is unlikely, however, that this treatment will have any effect on the rising blood pressure. This patient is probably suffering from benign hypertension in a mild form, and it is likely that the pressure will continue to increase with age. Hypertension is common, and according to S. C. Robinson and M. Brucer (*Arch. intern. Med.*, 1940, **66**, 393) slightly over 40% of the adult population is actually or potentially hypertensive. In the case described the condition is so slight that no treatment is indicated, and it is doubtful if the rise of pressure is great enough to cause the symptoms of which the patient complains. The possibility of a functional element should not be overlooked, and reassurance will probably help the patient a great deal.

LETTERS, NOTES, ETC.

Climate and Burns

Dr. FRANK MARSH (pathologist, A.I.O.C., Persia) writes: In the *Journal* of March 10 (p. 344), Prof. Kenneth Black, in a letter on climate and mortality from burns, brings evidence to show that a warm climate lessens this fatal incidence. We "enjoy" a climate with a very hot summer, and, by European standards, a moderately cold winter. It is true that we see more fatal cases of burns in the winter, but I think the main reason is that in cold weather cooking fires are lighted *in the dwellings*, and in summer the cooking is usually done outside. A very common cause of severe and fatal burns among women is the explosion of a "primus"-type stove designed to work with kerosene, and used, through ignorance or misplaced ingenuity, with gasoline. Such accidents are infinitely worse when they occur in a small room than in the open air, judging from results. In the open a metal or dried mud screen is built round the fire as a wind shield, unnecessary indoors. Kerosene and petrol burns are usually very severe, and a certain proportion are not accidental but malicious; frequently the victim is young, well developed, and good-looking. It is not claimed that these latter are factors affecting the mortality unfavourably, although statistically, no doubt, a case could be made out. Dirt is an unfavourable factor associated with cold; a sweating skin is probably a relatively clean skin. Certainly the mortality is much lower in the warm weather, but I have always thought this variation due to a number of contributory causes—such as more clothing worn out of doors than indoors, the exceptional severity of indoor-inflicted burns, the concealment afforded by a small windowless room for malice, the greater danger of explosions, etc., in a confined space, and the absence of wind shields, etc. I do not think the climate—blameworthy as it is in nearly every respect—can take the whole burden for the high mortality in Glasgow.

Oedema of the Ankles in Hot Climates

Dr. GEOFFREY HALL (Cunderdin, Western Australia) writes: In the *Journal* of Aug. 19, 1944 (p. 262), I see a reference to swollen ankles in hot climates. You might be interested to hear of a phenomenon I have seen here in pregnant women. In my last 100 midwifery cases there was one case of pre-eclampsia with albuminuria, but the percentage of cases of definite pitting oedema of the feet in the absence of varicose veins or any local condition was 5. Swollen ankles in the absence of albuminuria or other signs of toxaemia developed in these 4% of cases in the last three months of pregnancy, and invariably the patient volunteered that the swelling came up in hot weather and disappeared completely in cold. Thus the syndrome is analogous to swollen ankles in hot climates. In my cases no doubt the pressure of the head on the pelvic veins produces venous stasis in the lower limbs and aggravates the condition, but I feel that in both instances the syndrome is primarily due to peripheral vasodilatation from the heat, with increased capillary permeability. I can find no reference to swollen ankles in the condition known as "heat disease," but as the treatment of this is sodium chloride, I wonder whether such treatment would be effective in the conditions under discussion.

Treatment of Supraspinatus Tendinitis

Mr. J. R. ARMSTRONG, F.R.C.S. (Ely), writes: In discussing the treatment of supraspinatus tendinitis your correspondent (March 31, p. 468) does not mention excision of the acromion. This procedure, described by Watson-Jones in 1943 (*Fractures and Joint Injuries*, 3rd ed., p. 418, Livingstone, Edinburgh), is a certain, and in some cases the only certain, method of dealing with these lesions. The supraspinatus tendon impinges on the overlying acromion in the middle range of abduction, when the tendon is swollen or inflamed. This pressure produces pain and causes the painful arc of shoulder movement which is a characteristic feature of supraspinatus tendinitis, with or without calcification. Moreover, these repeated small traumata further aggravate the condition of the tendon. The rationale of excision of the acromion is obvious. Supraspinatus lesions seem to fall into two broad classes: those which tend to clear up spontaneously and those which do not. In the latter class the results of injection of the tendon have, in my hands, been inconstant and disappointing. This contrasts markedly with the almost dramatic relief produced by excision of the acromion. The operation itself is comparatively simple, the post-operative convalescence is short, and the subsequent function of the shoulder is normal.

Electrically Induced Convulsions in Epilepsy

Dr. H. PULLAR-STRECKER (Falmouth) writes: The idea of "letting-off steam" under controlled conditions of time and place appears useful in selected cases. As a criterion, however, tables should have a third column, showing the average number of spontaneous plus induced convulsions per month. In the four illustrative cases given by Dr. Gerald Caplan (April 14, p. 511), such number is roughly as follows: B.I. 4.5; O.P. 8.5; M.T. 10; C.A. 4.